

THE  
**SOUTHERN AGRICULTURIST.**

MAY, 1837.

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**PART I.**

**ORIGINAL COMMUNICATIONS.**

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*Cautions against using the Cultivator, and suggestions for the more extensive use of the common Plough among Sea-Island Planters.*

Mr. Editor,—As frequent allusions, have within the past year, been made to the Cotton Cultivators, invented by Mr. Townsend, and as the opinions which appear to be entertained of them, are calculated to do mischief to some of our agricultural brethren, (and particularly the young and enthusiastic,) I have thought that it would be doing an acceptable service to such, if by pointing out the true uses of that plough, I shall succeed in moderating the extravagant expectations, which some appear to indulge of the benefits to be derived from it.

A writer in your Journal for June, 1836, under the signature of "Colleton" has expressed the opinion, that "any planter introducing this cultivator upon his plantation, need never complain of grass," and expresses his "conviction, that in a year or two, these ploughs will be in as common use with the sea-island planters, as the skimmer is, with the people of Virginia." To both of these opinions, I dissent—to the latter entirely—and to the former, not the less so, if intended as a general proposition, and not limited by at least an equal number of exceptions. As these opinions, on my part, may appear inconsistent with the practice of the writer, who has been using these ploughs with much advantage, for the last six years, I have thought it a duty which I owe to my agricultural companions, to exhibit the reasons, which have

led me to those conclusions ; which reasons, Mr. Editor, you may make public, if you think they will be of benefit to your readers.

In performing this duty, I shall make myself better understood, if at setting out you will bear in mind, in the first place, the *objects*, which were *intended to be accomplished* by the use of Mr. Townsend's cultivators, and in the next, the *proper preparation of the field*, which is necessary, previous to putting them at work. In the first place then, the object aimed at, must be limited, to assisting in the *hoeing* of the field : which, it must be remembered, is only one of the operations in the management of the crop. These ploughs must be regarded also, as just stated, as an *aid* merely ; and not as a substitute for the use of the hoe. Who ever expects more from them, may continue to look for the benefit, but will not find it. They hold out no encouragement to the inexperienced, to *over-planting*, or to planting lands which are not properly manured. For although, by the aid of these ploughs, if they be properly directed, even *six* acres to the hand, may be kept "*free of grass*," even on these our grassy sea-islands, yet there is the *hauling*, the *thinning*, the *hand weeding*, and *manuring*, (each of them an important item, and the last an extremely laborious one, in the husbandry of the sea-island planter,) all still to be done by the ordinary process of slave labor and the use of the common hoe. If then, the planter undertakes only *five acres* to the hand, he will find, that he will have not a moment of breathing time, from the period when he turns out to field work, which is generally about the middle of January, to the time when he ought to lay by his crop, which should be about the middle of July. Provided he *manures* properly the whole five acres, he will not be able, except under the most favorable circumstances, to have that quantity planted before the 20th of April, nor be able to commence hoeing, much before the second week in May. If he then starts the cultivators, he will save half the time, and more than half the labor, which he would have otherwise to bestow, in the operation of his hoeings—but having an acre and a half more, both to *hoe*, to *haul*, to *thin*, and to *weed*, than is usually planted to the hand, he will find that the cultivators will scarcely regain for him, the time necessary for this extra work, without the greatest activity,

and the most skilful management are exercised throughout. And should he by any accident, have any of his cultivators broken, (to which they are very liable, from their light construction, if they encounter hidden roots in the alleys,) and should he not have a blacksmith at hand, which to our reproach, is too often the case on the sea-islands, the planter may esteem himself quite fortunate, if he does not get his crop swamped in grass.

The frequent liability to such accidents, suggests here, the consideration of the *next circumstance*, which I have stated should be borne in mind, in order to understand clearly, the reasons, why I think these cultivators will not come into general use—and that is, the *previous preparation of the field*, preceding the use of the plough. This preparation is much more briefly and easily pointed out, than in ordinary cases, it can be accomplished. It consists in the first place, in *forming the beds* of the proper *size and shape to suit the shape of the cultivator*—and in the next place, to *clear the field of roots*, and other stubborn impediments, by the liberal use of the grubbing hoe, whenever it may be necessary.

The cultivators were made to fit beds of the most approved shape and size; and when that is the case, there is no part of the bed or alley, which it does not effectually act upon. Of course, if the beds be badly made, that is to say, if the *beds* be *small*, and the *alleys* *high and ridged*, and withall *too broad*, the cultivator is not *suited*; and it must necessarily do, both insufficient and bad work; here leaving untouched a large portion of the bed, and anon running too deep in some places, to the injury of the crop, and causing increased labor to the horse. A field properly bedded will present the *alleys narrow*, and going down almost to a wedge in the bottom, and the beds with their *sides well filled out* and the *listing well covered*. If there has been little grass and weeds previous to listing, they can be easily covered, and the beds will appear *rounded* and rather *flattened* at the top. If on the other hand, the listing is high, from there being a heavy sward turned in, the beds will necessarily assume a more pointed shape at top. “St. Helena” in your last number, has given very good directions, on this point, and if his practice conform with his theory, I have no doubt, but that his beds *will suit the cultivator*. Whether “St. Helena” himself will suit it, remains to be proved.

I express this doubt, from no disrespect towards him personally, for I have no acquaintance with him, but from a conviction into which I have been forced, after much observation, on the character of our low-country planters—that *there are but very few of them who suit the plough*, and fewer still who will suit the “Cotton Cultivator.” They “do not like the trouble,” which the plough gives them; and having no practical knowledge of its advantages, there is nothing to stimulate them, to travel out of the old beaten road of *rotine*, to search after this “trouble.” Indeed as usually directed by the ignorant negro, to whom this work is in common, entirely confided; and with the beggarly accoutrements, and generally, with the insufficient teams, which are supplied, the ploughing is not only so badly done, but is, in quantity, so little, that it really is not profitable.

Even if satisfied of its advantages from observation of proper work done, in some neighbor's field, such a planter is nevertheless unwilling, to submit to the “drudgery,” as it is termed, of giving his own *personal attention* to the work; which is frequently indispensable, in order to detect and remedy whatever may be wrong in the plough, the gear, the team, or the ploughman. The immense *gain in time*, and the no less important *saving of labor* are but a poor compensation to him, for those claims which the plough makes, upon his personal inspection, and for the frequent interruptions which it throws in the way of his amusements. His horse and his hounds are around him, eager for the chase; or the whistle of the quail, with the impatience of his pointer, tells him that there is game, and attracts him from his fields—or perchance, the fluttering of the sail, reminds him of his line, and the sports of the river—these, singly, or in succession, to which may be added the pleasures of society, visiting, and being visited, are the claims which he is most ready to acknowledge. And shall one of them be relinquished or postponed or in any manner interrupted for the dull drudgery of seeing the plough perform well its work, of turning up the “vile earth?” Quite impossible! He may at the same time, be very desirous to partake of the advantages of that vulgar implement; and may be willing to go to the *expense* of providing proper gear, and a sufficient team, and fixing off the plough and ploughman, with whatever may be necessary for his work, so far as



money can procure it—(a very rare case by the by,) but then to *go in person* and *see*, that the plough and gear are in good order, that there is no defect about the construction of the plough, that the ploughman manages it well, and to make this personal examination frequently, so as to correct any defects—“there’s the rub!” It is easy to direct Pompey to take the plough and go to work, but whether he knows what good ploughing is, or how to set about it, has not formed a subject of examination, perhaps, not of inquiry, on the part of the master. The sagacious Pompey may among his other devices to waste time, or do no work, think that a *swingle-tree* may be dispensed with, and fasten the chains without one, immediately to the plough beam, (an instance of which I am informed lately occurred,) or he may commit some other blunder, equally pernicious, through ignorance, or design, and his master, not having gone to *see* what is going on, may become dissatisfied with his achievements, set the plough aside, and put Pompey to his hoe. In coming to this decision, he is “saved the trouble” of giving a personal examination into the business, and the “drudgery,” of making a personal trial with the plough, with his *own hands* if necessary, with a view to discover the defect. It is much easier for him to “damn the plough, (condemn, I mean, Mr. Editor,) and relaxing into the usual routine, content himself with “going on at the old rate.”

This is one species of that extensive class of planters *who do not suit the plough*, whom it may be added, the *plough does not suit*. We have supposed this species to be willing enough to undergo the *expense* of providing every thing necessary to do the work, but who fail nevertheless from indolence, or inexperience, or impatience, or want of inclination to such pursuits, which prevents them from giving that personal attention to the business, which *it must have*, from some one more intelligent than the negro race. With an experienced ploughman, who is at the same time, faithful to his duties, this liberality, in providing the necessary means, may command success; so long at least as he is confined to the plough to which he has been always accustomed—but if a new fashioned implement be introduced, the intelligence of the master, is always necessary, to explain its uses, and direct its first operations.

But there is another species, of that class of planters *who do not suit the plough* and whom the plough does not suit, (and unfortunately much the more numerous,) who to the deficiencies of their brethren just stated, superadd the virtue, so peculiarly the property of the planter, and which has been denominated, by one of the most eminent of the profession, the “prodigality of economy.” These, although liberal, and even profuse of their money, in all things else, appear, to think it their duty, to practice the most rigid and exact “*economy*,” (so they call it,) whenever any expense is to be incurred, in procuring the tools, implements, and other aids which may be required, towards the successful prosecution of their business.— “Why buy a plough at all, when I can bed all my fields three and a half acres of cotton and (even!) one and a half of corn to the hand, with the *hoe alone*, without the aid of the plough?” Convincing, certainly. But his neighbor uses the plough to great advantage, and gets ahead of him, in his work. “I think I will go to the expense, and get me one too, and plough up my land, and get along as he does. But ruinous extravagance and starvation! Why buy half a dozen *different kinds* of ploughs, when with one alone, I can ‘make out’ to do all sorts of ploughing, in all sorts of land.” The skill of a new beginner, and a learner, may be able to do so; but somehow, the long experience of the well instructed, whether from prejudice, or ignorance, have thought and acted otherwise. A plough is however procured, and we will suppose *properly stocked*—and now for the harness, and other appendages. “Why buy a pair of plough haimes when I can ‘make out’ with the old cart set, with a piece of cow-hide to tie the chains? Or why go to the expense of a *clivis*, when I can ‘make out,’ without it, by tying the swingle-tree to the plough-beam with a bit of cow-hide? or why pay the blacksmith for rings to the swingle-tree, when the other ends of the chains can be fastened to it also, with a bit of cow-hide? Or where is the necessity of buying a bridle or backband, or a pair of plough lines, when the eternal cow-hide, is at hand, ready, to ‘make out,’ and make up, all deficiencies!” This is the reasoning, which, many carry out in practice, in part or in whole, in their fancied pursuit after *economy*. The picture may be enlarged, by exhibiting their plough teams, whether horses, mules or oxen—poor,

worn out and weak, the consequence of neglect, hard usage and the want of sufficient nourishing food ; the first of which, it has been "too much trouble" to the master, personally to look after, and remedy : and the last too much expense for him to provide.

Is it surprising then that the plough, and such men, should part company, or that the planter should throw aside, in disgust, an implement, from which he had expected (unreasonably we allow,) so many benefits, but from which, he has derived so few ? As the party most interested has omitted to examine personally into the cause of his failure, let us Mr. Editor, submit to the "trouble and drudgery" of going into the "dirty field," where that humble friend of mankind, has been thrown aside, condemned, and in disgrace, and scrutinize the facts, with a view to deciding which is in fault, the plough or the planter, and make our report.

"The first thing that strikes us, in this examination, is that every thing about the plough-gear and the appendages of this *economical* planter is calculated to *waste time*. The ploughman has lost an hour this morning, in tying and untying the thongs of stubborn cow-hide, with which his beggarly harness is encumbered—which is certainly, not the fault of the plough, or the ploughman.

"Some hungry dog too, having through the night, gnawed away one half of the patent *clivis*, and dragged after him into his den, the cheap bridle and plough lines, two hours more were lost, in repairing these damages—for which also, surely the plough is not accountable.

"We find too, that in consequence of the trusty Pompey having appropriated to his own pigs and chickens, the grain which was allowed him last night, for his team, and his otherwise maltreating them, that the said team is so starved, and feeble, as to be utterly unable to do their work in a proper manner, and that after becoming exhausted before half the day was spent, and been most cruelly beaten, for not doing what they were physically unable to perform, the cunning Pompey, then left the field, and persuaded his master, that it was the fault of every thing else except himself, that his task was not finished—which is still we submit, not the fault of the plough.

"It appears furthermore, upon examination, that the plough is quite *unsuited*, both to the *soil*, and to the parti-

cular *kind of work*, to which it is applied, and that in consequence the work is both ineffectually and badly done; but that having no other kind of plough, the economical planter, was trying to "make out" with the one, then and there in use, which again furnishes no good reason, why the plough should be condemned."

Now Mr. Editor, we undertake to say, that a strict examination made by the master in *person* and *with care*, with a view to discover the causes of failure, will lead, in most cases, to faults and defects either similar to, or identical with those above recounted. I undertake further to say, that if the planter would only accompany his ploughman, for a short time, through the *details* of his work, and witness with his own eyes, the annoyance, and delays, to which he is every moment subject, from these cheap contrivances, that his disgust would be so great, that he would not tolerate them for an hour, but would instantly procure every convenience which the work might require, no matter what may be the cost.

But although *parsimony* and *indolence* may be frequent causes of failure, and may contribute their share in establishing that *unsuitableness* between the plough and the low-country planter, I think the pre-eminent cause of this state of things is their great *inexperience*, or more properly their deficiency in *practical* knowledge, in regard to all the duties, belonging to the plough. It is an implement, against which so many prejudices have existed, on the sea-islands—one, which has hitherto been so little in general use, among them, that it is hazarding but little to say, that there are but few of the planters in that interesting belt of our country, who have ever seen a plough do, what deserves to be called *good* work, and fewer still who know the process by which such work ought to be done. *Ploughing* is an art, and although esteemed (very erroneously) a very vulgar one, it is nevertheless, like most of the sister arts, to be mastered well, only by favourable means of observation, or the slower process of dear bought experience. But to whom around him, shall the low country planter apply, to instruct his ignorance? Shall he go to his neighbor? Unfortunately, he is as ignorant as himself, of all practical knowledge of the art, and he witnesses in his field, the same dissatisfying performances by the plough, which have just discouraged him with his own. What next, Mr. Edi-



tor? Look around you, and your answer is ready; "the plough is depreciated, despised and abandoned." Thus the very infrequency of the plough in our low-country agriculture operates as an obstacle in introducing it into general use. *Indolence, inexperience*, and frequently *false economy*—these are the agents, which render the sea-island planter, in most cases, *unsuited* to the *plough*, and the plough unsuited to him.

But if this be the case with ploughs in general, there is something in the *cotton cultivators* of Mr. Townsend which render them *more unsuited* still, to the generality of planters. The common kind of ploughs, if (as commonly managed by those among us who do use them,) they do bad work, and but little in quantity, are yet *strong*; are not easily broken. The cotton cultivator, on the other hand, is light in workmanship; and if the roots be not carefully removed, will easily get out of order, and fail the planter, when, perhaps, he most needs it. The common kind of plough, requires no previous preparation of the field for them, before they can be started: but if you will bear in mind, what I have already said on that point, then examine how the work is done in most fields, you will perceive, how few of them there are *which suit* the cotton cultivator. Look at that field of Mr. A. with its wide flat alleys, and its beds resembling more the unpretending mole-track, in a garden walk, than a well formed cotton bed—that field *will not suit* the cultivator. Examine next, the field work of Mr. B. in which there appears to be, *two little beds*, and *two shallow alleys* in every space of *five* feet. One of the little beds, is intended for the cotton, the other, which so nearly resembles it, is intended—for nothing. It is only a "high ridge," left where the bottom of the alley ought to be; and necessarily makes two shallow alleys, between the beds, when there should be, but one deep one. That field *will not suit* the cultivator. Proceed next to the field of Mr. C. covered with the *bushy shoots* of the chinquepin, casena, gum and persimon. These bushes have been regularly cut down, ever since his "grand-father tilled that field," every time it came in turn to be planted; but the *roots* from which they spring, have been as regularly left untouched, and will descend as an inheritance to his children, to the third and fourth generations, to annoy them. That field also, *will not suit* the cultiva-

tor. Proceed next, to the fields of two-thirds, of the balance of the alphabet. Their land is badly *bedded*—the beds *too small*, the sides *too scant*, the alleys *too wide*, and an unsightly ridge, left in the *bottom of them*—these, though better than Mr. A's, or Mr. B's, still, do not suit the cultivator. "But Mr. R. Mr. S. and Mr. T. surely, their beds are *well formed*. Their fields too, have been for a century, under cultivation, and all *bushes* and roots have been devoured, by the tooth of time." It is admitted that *these* fields, suit the cultivator, but then the cultivator *does not suit their owners*. Mr. R. has not patience, perhaps not experience enough, to use *even the common plough* upon his plantation; how then can he be expected to introduce the cultivator, which will require I can tell him a little more patience, and no small share of perseverance. Mr. S. entertains so exalted an opinion of his own skill as a planter, and is so satisfied, that with his superior management, "he can make as much cotton as he can pick," that he scorns the aid of *all* ploughs; and considers any thing like a cultivator, as quite useless. Whilst Mr. T. indolent in habits, and suspicious of innovations, surrounded withall, from the beginning of his career, by every natural advantage, which has made him in general, successful, and comfortable, looks askant, at this new intruder upon old practices; is "not *sure* that it will be any improvement upon his present system, and as he has got on very well, heretofore, he is determined, "unchanging and unchanged," "to jog on at the old rate."

After this examination, of the *appropriate uses* of the cultivator, of what it requires, as indispensable, in the *preparation of the field* previous to putting it to work, and showing the *existing unsuitableness* of our low-country planters, generally, to the use of ploughs at all, I think that you will agree with me, in the dissent, which I have expressed to "Colleton's" opinion, and come to the conclusion with me, that so far from these cultivators coming into general use, on the sea-islands, they will be used only to a very limited extent; and next, that so far from there being, "no fear of grass," wherever they are used, there is much probability, that they will be the cause of many crops being injured or lost, by grass, particularly if adventurous planters undertake five or six acres to the hand as some appear inclined to do. As I have used

them extensively myself, I have thought it my duty to give this caution to my agricultural brethren, who may not have tried them; in order that they may not leap into "more trouble" than many may anticipate, or be inclined to undergo.

With all the discouraging circumstances, however, with which they are accompanied, I am still equally decided in the opinion, that they will never be entirely *abandoned*. There are some planters, who are suited to the plough. They appear to be attracted, towards that faithful old servant in the agricultural family, with a sort of respectful and reverential regard. They are willing to treat it well, to do it justice, and give it a fair chance: such planters being convinced, of the immense benefits it confers upon them, in return for such treatment.

Would you know the marks Mr. Editor, by which such men are distinguished? You are learned in the science of "phrenology" I believe. Spread your fingers then over the cranium of that planter near you, and you will find the organ of "acquisitiveness," strongly developed; "constructiveness," tolerably large; "self-esteem," not deficient; and quite an unsightly *bump* over the organ of perseverance, ("firmness" I believe it is styled.) If any of the fraternity have improved upon Dr. Spurzheim, and since Mr. Combe's great work, introduced among the family of "propensities," one for the "plough," of course, it will stand pre-eminent, above all its companions, and will not escape your learned fingers: but if not, then the above developements, will lead you with sufficient certainty, to the discovery of the planter, who has a *suitableness to the plough*. They are qualities, which are followed by but little applause, from the generality of mankind. Each are necessary however, whether praiseworthy or not, to make up the character. A desire first, to reap the *greatest profit* from his agricultural capital; next, some little taste for *mechanism*; next, a reasonable *indifference to the opinions of others* (when those opinions are deemed the result of prejudice or false pride,) which makes a man not ashamed to do whatever his business requires him to do, and puts him on level with, and not *above* his employment; and lastly that perseverance, which never gives way to every little difficulty, but attacks it again, and again, until the difficulty vanishes.

Such are the kind of planters, whom the cultivator *suits*, and who will prepare every thing in their field, and elsewhere, *to suit the cultivator*. "Colleton" appears to think, that the generality of planters, are of this description—I think, on the other hand, that they are, at present, very few.

Having said sufficient to put planters on their guard, how they introduce the cultivator upon their plantations, by stating the discouraging circumstances attending it, it may be expected that I should present here, also, the *advantages* to be derived from it, and which have induced me, to continue the use of it. These are briefly stated.

1st. I can gain time by it.

2d. I save labor by it.

3d. I can plant with safety more cotton and more corn to the hand: not much more it is true, owing to the necessity of *manuring*: for as I make it a point, to manure at least all my cotton land, it follows that for every half acre, or acre, which is added to the usual quantity, is the time and labor, for that work, proportionately increased. "Not having the fear of grass before my eyes," now as formerly (which has ever been a standing count in the indictment, against those who are guilty of the high crime and misdemeanor, of "overplanting" themselves,) I make greater efforts now, than I formerly did, to get *more land manured*: knowing, that after that laborious work is over, the *bedding* is easy enough, with the aid of *ploughs*, and the subsequent tillage of the crop, equally as easy, with the assistance of the cultivators.

The advantages of the cultivators can be best explained, by placing the ancient system of management, with the *hoe alone*, in juxtaposition, with what, I am disposed to call the improved system, with the *aid of ploughs* and cultivators. But Mr. Editor, as this communication has already extended, much beyond the limits, which I had originally prescribed to myself, I am admonished of the necessity, of concluding here, for the present; and perhaps, may resume the subject in some future number of your journal.

I am in the meantime

Very respectfully yours,

ST. JOHN'S COLLETON.

April 12th, 1837.



*On the Cotton Culture.*

*Mr. Editor,*—In forwarding to you my annual subscription, I shall follow the laudable example of some of your subscribers by furnishing you a few practical remarks for publication. An emigrant from your own state, and the vicinity of your city, formerly engaged in the culture of the long-staple cotton on the main lands, conversant with the modes of culture prevalent there, and now engaged in growing the short cotton, upon the plans adopted throughout the whole western country, my experience has enabled me to detect some of the errors formerly practised by myself, and my neighbors in Carolina. My attention has been called to this subject by the perusal of an article in one of your late numbers, signed "An Observer," giving an account of the crop of E. Frost, Esq. in St. Andrew's Parish. Mr. Frost, it appears, planted according to the low-country system, four acres of cotton to the hand, and each hand made 4,000 pounds seed cotton. This, the writer considers an extraordinary production—and for that region of country, so it is. It may safely be predicted that it will not soon be equalled by Mr. Frost, or any of his neighbors. With hands till lately accustomed to the same manner of working, I planted last year, ten acres of cotton and ten of corn to the hand. I never had a cleaner crop, and though the season was excessively wet, my negroes never performed their tasks with greater ease. The cotton crop, seriously injured by the worm, yielded 800 lbs. to the acre, and 8,000 lbs. to the hand. Mr. Frost's land exceeded mine in productiveness, yet my crop doubled his. His, is considered so extraordinary, that it is held up as an argument against emigration—mine, was an ordinary crop, nearly doubled by many of my neighbors. But the question to be solved, is, how is this difference in the results obtained?

It is unquestionably true, that the soil and climate of the west, is better adapted to the growth of cotton—that here, a plant of the same size, and on a soil of equal strength, will send forth and retain a greater number of pods, than upon the sea-board. It is equally true, that the grass will grow as rapidly and as plentifully in the one place, as in the other. The difference in soil and

climate has not however as much influence, as is generally imagined, by residents on the sea-board. Would they adopt the same management, pursue the same modes of culture, which, somewhat modified, they unquestionably can, there can be no doubt, that though they could not obtain the success of the western planter, yet they would make some approximation toward it.

What then is this management and mode of culture?

1. The overseers are practical men and well paid for their services. Those most readily, as well as most generally employed, are such, as in addition to the general qualifications of integrity, industry and sobriety, have once tilled with their own hands their own soil or have *cropped it* with others. They know what they have done themselves, and consequently what to exact of others; what the implements of labor should be, and most generally how to make and to mend them. It is with them common law, and almost universal custom, that they are to rise with the negroes, remain with them while they are in the field, and personally direct and inspect all that is done. They fear not labor, rain or sunshine. To be seen attending to their business by negroes or employers, on *horse-back*, with *glove on hand* and *umbrella over head*, they would feel as a personal degradation and justifiable cause for "notice to quit." In general they will have no driver under them, by his example to teach others how to be drones, to do nothing himself, and to expect or exact little of others, and to divide responsibilities with them. In quickness of step, facilities, and despatch of business their example and theirs only is to be imitated. When the hands are necessarily divided, so that all cannot be under their direct inspection, they select one in each gang to be the foreman, and such a one, as will take a pride in being a leader, and will faithfully report all defaulters.

2. Negroes are well fed and clothed. They have their weekly allowance each, of three hundred pounds of bacon, or its equivalent, and as much hominy or corn flour, as they can consume, ground at the mills, delivered to them. When potatoes and peas are in season, they are permitted to use all they may want.

2. The horses, mules, &c. used on the plantations are of good quality, and well used. When purchased they must be recommended by their capacity for hard labor,

and for the quickness of their step. If these are obtained, expense is a secondary consideration. The judicious planter does not act as though he thought that an animal good for nothing else fit for the plough. He will not use his broken-down carriage horses, mules worn out by harsh treatment, nor "old field tackies" which cost the catching of them, and waste the time of his negroes in following their snail-like steps. The description of horses and mules used under the charge of an overseer, such as has been described, ensures in a land of plenty, the greatest care and the best treatment.

4. But it is by the use of the plough that so much is achieved. By it, the beds are prepared for planting, the trenches or drills made, and the seed covered. By it the most part of the grass is destroyed and the plant furnished with the requisite earth for its support and sustenance. By it the use of the hoe in a great measure may be dispensed with, and when used it will require comparatively but a small portion of physical strength.

It does appear to seem strange that the hoe-culture should ever have prevailed to the extent that it has on the sea-board, and more strange, that it should continue in this utilitarian and labor-saving age. Is it objected that the lands are low and intersected by drains and canals? There is indeed some force in this objection, but not enough to exclude the use of the plough. The lands in many places might be cleared and drained with a reference to its use. It may be safely affirmed, that there are few plantations, where the labour-saving machine could not be used, to the reduction at least of one-third of the manual labor.

It may interest some of your readers who groan under the pressure of their crops of eight acres of corn and cotton to the hand, and whose fears are alarmed lest the grass should overrun them, to learn how, by the use of the plough, twenty acres to the hand can be planted and the same crop secured. I will therefore give you in detail the arrangement of the crop on our plantation last year. There were, beside the regular crop, 75 acres of oats, potatoes, and slips enough for the use of the plantation, and about 15 acres of wheat. The plantation worked 30 hands,—15 at the plough, the rest with the hoe. In March, 300 acres were planted with corn, on land previously well ploughed and checked. In the first week of

April 300 acres of cotton were planted. The land was prepared by throwing together, with a turning-plough, in the alleys of old cotton-fields, four furrows. Thus bedded, the drills were opened with a small scuter, or bull-tongue plough, in which the seed was sown; they were covered by a board fastened on the plough-stock, in the place of the mould. The drilling, planting and covering occupied four days and a half. There was an excellent stand, and no replanting necessary. The ploughs and hoes then went into the corn-field. These were well ploughed and hoed by the time the cotton was out of the ground and required work. The cotton was four times ploughed, and as often hoed, and when laid by in July, a hat would have held all the grass that could have been found. The corn was twice more ploughed, and once hoed. The grass was constantly kept down by the ploughs. The daily task of a hoer was 100 rows of cotton 100 yards long. The first and second hoeings, when the cotton had to be chopped out and reduced to a stand, proved good, though not severe tasks; the other hoeings were light, and the workers were often out of the field by 12 o'clock. The crop was well worked, and with ease, by low-country hands, who would think it the worst calamity that could befall them, to be compelled to return to the place of their nativity. The mules and horses were in as good, if not better, condition than when the ploughing commenced.

In this exhibition which I have given you, of the management and mode of culture adopted by Western planters, and of the working of a single crop, it appears to me that a stronger argument can be found against emigration from your shores, than can be deduced from the plans of Mr. Frost, or the suggestions of "An Observer."

C.

*Houston County, Georgia, April 1, 1837.*

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*Six-Acre System of Cotton-Culture.*

At last, Mr. Editor, you have brought your champion into the field. He obeys your summons, and comes prepared to break a lance with me; while you settle yourself complacently in your editorial chair, to enjoy the conflict, and mark its varying chances, with the *gusto* of an amateur! I might well decline the combat, were I so disposed, on the ground of inequality of arms; for the compe-



titor you have called up to meet me, has a certain awkwardness in handling the implements of husbandry, and talks so fluently the while of "issues," "verdicts," and "appeals," that I cannot but fancy that I detect the gown of another profession, peeping forth, from beneath his farmer's frock ! What ! Mr. Editor, has it come to this ? and cannot a planter venture on your columns, without the risk of being hung up in chancery ?

But though my competitor is thus *doubly* armed ; I decline not the contest ; "*thrice* is he armed who hath his quarrel just ;" and, simple farmer as I am, I tilt at him with my *plough*, though he brandish a *hoe* for a falchion, and a *Blackstone*, for a shield.

I cannot but be sensible of the involuntary respect which "Colleton" has paid me in your last number ; for he has left the positions taken by Beaufort, actually unattempted ; and has assailed those which he never held nor fortified, and which no point of honor calls on him to defend. "To the use of the plough, (says Colleton,) I object not. I believe it a great means of facilitating our agricultural labours. But, sir, does this prove that this implement, used upon six acres *imperfectly manured*, will make more cotton than when used upon four acres, well manured ?" Why, sir, I never said that it would. This is no proposition of mine. We may prove it, or disprove it, without affecting any position for which I am accountable. I said, on the contrary, (July number) that it would be 'absurd' to cultivate unproductive land, merely to make up a certain quantity to the hand. I never recommended the six-acre system, for *universal practice* ; but limited it expressly to such plantations as could furnish the quantity required, of land *unexhausted*, or manured up to the productive point. The question—whether it was best to plant largely to the hand?—I maintained was one which we should decide judiciously for ourselves, (as knowing our soil and means of culture), and "rashly" for our neighbours.

"I am afraid, (says Colleton) that were Beaufort asked whether he had applied the same quantity of manure to four acres which he has done to six, he would be unable to answer in the affirmative." Colleton is again mistaken. Beaufort can answer with perfect confidence, that the land on which the *four acre* plan was tried, was not only originally the best, but the *best manured* ; the short crops

having left more labour at the disposal of the proprietor, to be applied to manuring than on the other plantation, whereon the six-acre system was tried. "Ought Beaufort to be content with the result of the six-acre system?" It would be strange if he were not. The only inquiry for him is, with two years' experience, warning him to the contrary, whether he ought, whether he would be doing justice to himself, to give the *four-acre* plan a further trial!

The proposition maintained by Beaufort, fairly stated, is simply this—"that the planter who can command six acres of land to the hand, either unexhausted, or manured up to the productive point, will make more cotton to the hand, by cultivating six acres, assisted by the plough, than by cultivating four acres with the hoe alone. We will now try this proposition by the *four grounds of appeal*, set forth by Colleton.

"1st. That equal quantities of manure, applied to four acres and to six, will manure four acres better than six." Denied! If by *better* is meant *more profitably*, for by Beaufort's supposition, two acres of the six, may be *unexhausted* or already adequately manured, so that the *given parcel* of manure may go as far on the remaining four acres as on the entire four of Colleton.

"2d. That, upon the principle, that much is always less than more, four acres manured with one fourth of a parcel of manure will produce more than one acre manured with one eighth of the same parcel." True, by four to one, with a fraction to spare! We suspect some misprint here: but whatever *logical* learning this "2d ground," as stated, may have on the question at issue, will be found in favour of the proposition maintained by Beaufort.

"3d. That, it requiring less time to go over a shorter space than over a longer, the same labor can go over one acre oftener than over one and a half." True, in point of fact; but it settles nothing, since it may go over the one acre oftener than is required, and therefore unprofitably.

"4th. That Beaufort's verdict, in favor of the six-acre system, is unsupported by evidence, it being a notorious fact, that in those countries where less land is cultivated to the hand, the best and most abundant crops are made, in corroboration of which, we would mention the worn out lands of Scotland, England, and Germany, in comparison with the new and rich lands of the United States and Canada."

Now, Mr. Editor, if the question were, the product *to the acre*, the European authorities of your correspondent would stand him in good stead. But as we are speaking of the product *to the hand*, would it not be more in point, to draw our conclusions from the practice of our own country? Who make most corn, or short-stapled cotton to the hand; the planters of the interior, who cultivate largely with the plough, or the low-country planters, who cultivate the same staple, with a more sparing use of that implement? If the product to the acre was the desideratum, we must dispense with the hoe, as well as the plough, and confine ourselves to the spade, the *wooden spade*! that primitive, unsophisticated implement, which has the sanction, not only of the older continent, but of the earliest times, as we may *infer* from the distich, so memorable in English history,

When Adam *delved*, and eve span,  
Who was then—a gentleman!

In conclusion, Mr. Editor, the six-acre system of Beaufort is supported, by actual experiment, and opposed by generalities that are inapplicable, or theories that are untried. It is based upon the fact (for the truth of which all experienced planters will vouch,) that there is a point of manuring, beyond which all further manuring would be hazardous; that there is a point of cultivation beyond which all further culture would be an injury. The reasonings by which these points are sustained, have been given in two former essays, and I must be excused from repeating myself. Colleton would evade their force by making a new issue and cultivating 4 acres with the plough and hoe! To what end? Is it not he who says the hoe can do "*four acres*," and the "*plough twice as much*?" Is not this a new lesson in rural economy? Colleton will soon be as much embarrassed with his surplus labour, as our government with their surplus revenue! But let him try the plough. He will soon weary of limiting that instrument to the compass of a few acres. As soon might the musician confine himself to two octaves when the entire scale lay at his command. Let him try the plough, and he will find that, in the recommendation of *six acres*, I have underrated its power. He will be a convert to the system, and will reach so gratifying a *decision*, that he will desire no further *appeal*!

BEAUFORT.

*On Grasses.*

Columbia, South-Carolina, April 3, 1837.

*Dear Sir,*—I herewith send you a letter from Mr. Camak, on the subject of the Gama-grass. And as I conceived it might be of public advantage to publish it, I have obtained his consent to do so with his name. I therefore send it, together with my reply to the same; and request you to insert both of them in your *Agriculturist*.

Mr. Camak desires that you will precede these letters, by so much of my article on grasses, as relates to the gama-grass.

Yours, Mr. Editor, very respectfully,

JAMES DAVIS.

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[*Extract from an Article on Grasses, by Dr. James Davis.*]

I have reserved an account of the Gama-grass for the last, although in the order of time it was one of my early experiments. I have done so, because it has flattered me with a much better prospect of success than any other grass, and therefore, I have more to say on the subject. In the summer of 1832, I collected with difficulty, as much Gama-grass seed as would plant a small lot. It was planted in December, (in drills eighteen inches apart,) of that year, on a sandy lot, pretty highly manured. It came up in the April following, and grew off flourishingly, which it has continued to do ever since. Being desirous of increasing my seed, I have reserved it to the present time for that purpose; and have neither fed it down nor cut it, except some small parcels, which I cut to ascertain how it would be eaten by the horses and mules, both by way of soiling, and in the form of hay; which experiments have been fully satisfactory,—as I have stood by, and have seen the horses, with sweet corn-blades and gama-grass hay before them, eat of each without discrimination or preference for either—partaking first of one, and then of the other. They eat it greedily also in the withered state, by way of what is termed soiling. The grass on this plot grows with prodigious luxuriansness, the blades getting the length of ten and twelve feet, and forming a sward on the ground, as it bends down and settles, of the depth of eighteen or twenty-four inches. I have been sedulously engaged in collecting seeds from this lot, and from other sources, for which I have paid twenty-five cents a quart, or ten dollars per bushel, until I have now a lot of three or four acres on rich alluvial bottom lands. The grass here is luxurious and fine, and next year I expect to reap a most abundant harvest from it. It has been apprehended by some, that this grass is too coarse to be eaten by horses and mules; but I am fully persuaded, indeed convinced, that this is a groundless apprehension. My own limited trials, and authenticated trials from various quarters, all concur to shew, that these animals not only eat it, but that they eat it with avidity. It is true it may be left to stand without cutting, until it gets too old and tough; but there is no necessity for this. Its growth is so rapid, that it may be cut every month, and even at shorter intervals from April until frost, of a length of from twelve to twenty-four inches. When in this young state, it is as succulent, tender and nutritious, as any grass I ever saw.

The only objection I know of to this grass, or rather, the only difficulty attending its culture, (for, in fact, I know of no objection to it,) is the difficulty



and tardiness of propagating it. It yields seed in abundance, but still they are scarce, and what is likely to keep them so, is the singular manner in which the seeds mature: they form in a spike at the top of a tall seed stalk, and mature only one seed at a time. Its maturity is readily known by its dark chocolate colour, but if not gathered at once, it is apt to be lost. The seed seldom adhere to the spike, after maturity longer than 36 or 48 hours, and when it falls it is concealed in so dense a sward that it is utterly useless to look after it. Of course, the collection of the seeds is a most tedious process, requiring the daily attendance of hands for several weeks; and although the mature seeds vegetate with sufficient certainty, if planted in November or December, yet from the carelessness of the collectors, and especially when collected for sale, many unripe seeds are sure to be gathered, which renders their vegetation very precarious. This circumstance will, doubtless, retard its extension and rapid propagation, but, I feel confident, it will inevitably work its way, and ultimately be found on every plantation, and then will be esteemed as second only to the richest staple production in the State. Besides its abundant yield, and its nutritious qualities, it has some certain habitudes peculiar to itself alone, which recommend its culture. In the first place, such is its special adaptations to our climate and soil, it revels with luxuriance on sandy pine lands, on stiff lands, and light lands, on the rich alluvial soil of the river bottoms, and on the highest and dryest soils, and on the moist lands of the water courses. I have never seen it growing on boggy lands, but I have seen it on the sides of creeks, where it was subject to be overflowed by every freshet, and there it grows so rank and vigorous, as to show that it delights in those inundations. Again, it is not only perennial, but it forms larger and stronger roots every year, and grows ranker and stronger, and the period at which it may die out is entirely unknown. But, forming a conjecture from such circumstances as are known, it is, doubtless, a plant of many years' duration. Indeed, so strong a possession does it take of the land, that after five years' growth, it will be impracticable to reclaim the land from it, but by the mattock and grubbing-hoe. No plough in this country can do any thing with it. These are rare habits of the plant, and will strike every one as rendering it invaluable; for no grass will be found profitable which requires much pains to cultivate it, and keep it set upon the lands. And moreover, if the seeds could once be had cheaply and abundantly, it could not fail to prove one of the most powerful restorers and fertilizers of our exhausted fields and hill-sides, that has ever been tried. When once well set all washing of the land would be at an end; and if suffered to grow uncut and unfed for four or five years, to shade the land in summer, and to spread its own substance on the land to rot in winter, it could not fail to make the poorest exhausted old field extremely rich. It would require labour to grub up the roots and reclaim the land, but when done, the roots alone would give a rich supply of manure.

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*Athens, Georgia, March 6, 1837.*

DR. JAMES DAVIS.

*Dear Sir,*—I have to day read, with great pleasure, your article in the *Southern Agriculturist* "On Grasses for South-Carolina;" because, in it, you speak, I think, in proper terms of the Gama-grass. I began my experiments with it, about the same time with yourself, and very soon became convinced of its exceeding great value. My attention was directed to it from the conviction, that we must look among our native grasses, if we wished to procure plentiful supplies of forage for our cattle.

You remark, that the only objection you know of, to this grass, or rather the only difficulty attending its culture, is the difficulty and tardiness of propagating it. Allow me to suggest, most respectfully, that your "objection" is very easily obviated. All you say of the difficulty of collecting the seed, I have found to be exactly true. I attempt not, therefore, to collect seed; but let it drop; and dig over the surface of the soil in the fall to cover the seed where it may happen to lie. In the Spring following I find it comes up thick; and taking advantage of a moist day, I take up the young plants, and set them out where I want them to remain. They are so tenacious of life as to occasion no loss in transplanting.

I have tried another mode of propagation with equal success. I take up the old bunches early in the spring, and divide them; and set them out again (just as shallots are divided and set out); and I have found that they grow without any difficulty. I have taken up a single bunch, one year old, that when divided gave me *seventy* plants.

In either of these modes, if diligently pursued, there is really no difficulty of propagation to complain of; when we consider the very great value of the thing when it is done: and its very great durability; as you may easily prove by figures.

An acre set 2 by 2 feet, will contain about 11,000 plants. Suppose a bunch one year old, when taken up and divided, gives only 30, instead of seventy offsets. To plant an acre the second year, you have to begin with 366 plants. Taking both modes together; that is, dividing the roots, and taking up what comes up from the seed, and half that number of plants would be enough to begin with. But suppose it required double the number; I think tardiness of propagation should not be an "objection," especially as an acre once planted will last a man his lifetime, most probably.

As to duration, the only information I have is derived from a gentleman of Alabama, who states that *nineteen* years ago he enclosed a lot of it, as he found it growing on his land; and that now it is better, and yields a greater crop than when he enclosed it.

I have ascertained satisfactorily, that *thirty thousand* pounds of green grass to the acre, is a moderate crop.

Carefully dried, the loss is as 17 to 5: that is, 17 pounds of green grass will give 5 pounds of well-cured hay.

No man who has the slightest regard for the independence of his own state, or for his own comfort, should lose a moment's time in getting a few acres well set with grass. For hay, or green food, or soiling, both in case of cultivation and in value, it is as far above the clover and timothy of the north, as our cotton is above their onion crops; and the only thing that can prevent its universal cultivation here, will be our over propitious climate: adding another to the many facts already existing, going to establish the truth, that where nature is over bountiful man is always a spoilt child.

If the hints I have given shall be of any service to you, I shall be particularly gratified.

Very respectfully, JAMES CAMAK.

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Columbia, South-Carolina, March 11, 1837.

*Dear Sir,*—The testimony you add in your esteemed favor of the 6th inst., in favor of the culture of the gama-grass; and the suggestions you offer for surmounting the difficulty of its propagation, are particularly gratifying. Fully persuaded as I am of the vast importance to this state, and, I have no doubt, to Georgia likewise, of cultivating the grasses in conjunction with the cultivation of our favoured staples, I cannot but hail, as a happy presage, every effort that is attempted in furtherance of that object. And as the gama-grass must assuredly hold out a fair promise of a rich reward, I think every intelligent patriot discharges one substantial duty, when he encourages the extended cultivation of it.

Your suggestions for facilitating the propagation of this valuable grass are striking; but still I am afraid they do not remove the difficulty, so far as we would wish.

You speak of letting the seed drop and lie, and digging the surface of the soil in the fall, to cover them. When they come up in the following spring, you transplant them where you intend them to grow. Now, according to my observation, this plan, in the usual close way of planting, is only practicable during the first and second years of its growth; before the grass has spread much, and before it has taken on its wonted luxuriance. On my lot, which

is high sandy land, and not very rich, after the second year, if I do not cut it, but leave it to go to seed, the sward becomes so rank, and covers those spaces between the drills so densely, that it would be absolutely impracticable to dig the ground under it in the fall. Indeed, it is with no inconsiderable trouble that we can wade through it to gather the seeds from their spikes. And moreover, if I ever had a crop of young plants in the spring, under the deep and heavy bed of dead grass that covers the ground, it would cost a good deal of labour and pains to remove it, and get at them. As I before said, therefore, it seems to me this plan will only succeed during the first and second years of its growth; and whilst it is yet not very prolific of seed. Or perhaps the difficulty may be obviated by planting in rows very wide apart, in a lot purposely set apart for the purpose of raising young plants.

Your other plan of taking up plants of two or three years' growth, dividing and transplanting them is, doubtless, perfectly practicable. I have, myself, divided a tussock into seventy good plants. But as you say, if they will only furnish thirty, then, twenty-nine thirtieths of seed will be dispensed with: or one bushel of seed may be made to plant as much in this way, as thirty bushels when planted from seed in the ordinary way.

This plan, although not difficult, must, nevertheless, be rather tardy; but, as you justly remark, when we consider the great value and durability of a lot, when once set with it, the objection dwindles into insignificance.

The whole tenor of your letter is so apposite to the subject, and so well calculated to encourage the culture of this grass, that I must beg your permission to send it to the *Southern Agriculturist* for insertion. And as articles of this description lose nine-tenths of their value and authority by appearing anonymously, I hope you will permit it to be published with your name.

I am, dear sir, respectfully, your most obt.

JAMES DAVIS.



## PART II.

### SELECTIONS.

#### *Knowledge of Plants applied to Farming and Gardening.*

[FROM THE GENESEE FARMER.]

The chief advantage of a scientific knowledge of plants is, that it teaches the *general laws* of vegetable economy, and we are enabled to apply this knowledge to a great variety of cases which occur in practice. Instead of being under the necessity of ascertaining by experiment, a great number of facts, we determine a general principle by experiment, and this general principle serves as a foundation, from which we may at once judge of the truth or error of any thing which may be directly referred to it. We hope it may be interesting to the younger class of our readers at least, to take a very brief view of the science of Botany, and the manner in which botanical knowledge is applied in practice.

Botany is that part of natural history which treats of *plants*. The term *plant*, in its most proper sense, applies to everything in the vegetable kingdom, from the smallest herb which we tread upon, to the largest forest tree. It includes everything from the minutest moss upon the rocks, to the gigantic pines upon our western coast, of sixteen feet diameter and two hundred and thirty feet in height.\*

The number of different plants which botanists have already named and described, amounts to nearly sixty thousand; hence, without scientific arrangement, such a vast multitude would be but an inextricable mass of confusion. Plants are accordingly divided into classes into orders, orders into genera, and genera into species; those being placed in the same divisions or groups which have some common, fixed and leading characters or resemblances. Without this arrangement, if an unknown plant should occur to us of which we should wish to determine the name, it would be as impossible to determine such name by description, as it would be to find a word in a dictionary without arrangement. We would have to turn over many thousands before we might chance to find the right one. But by means of arrangement we turn directly to the description, in the same way that we turn directly to the definition of a word in a

\* The *Pinus Douglassii* upon the banks of the Columbia river, forms extensive forests and grows to the height of two hundred and thirty feet, and is upwards of fifty feet in circumference at the base. The *Pinus Lambertiana* grows in Northern California, but does not form dense forests. One tree which had blown down, measured 215 feet in length, 57 feet in circumference at 3 feet above the root, and 17 feet 5 inches at 134 feet above the root. Some of the standing trees were evidently taller.

dictionary by means of the alphabetical order of its arrangement. In determining the name of a plant, we first find the class to which it belongs, then the order of this class, then the genus of this order, and lastly the species of this genus. All plants belonging to the same species, are considered to have originally sprung from the same seed. Consequently if there are different varieties belonging to a species, they must have been produced by changes in successive generations of that species. But the seed of one species can never so change as to produce plants belonging to a different species. For instance the pear and the apple belong to the same genus, but to different species; consequently seeds of the pear can never so change into varieties as to produce apple trees; nor can seeds of the apple ever produce pear trees. There are many different sorts of apples, which are all varieties produced by a change in the original seed of the species, but no change of this kind in any species can ever produce a different species. Hence, if a farmer should hear the opinion advanced, that one plant may deteriorate or in any way be transmuted into another plant, he should ascertain whether the two named plants belong to the same species or not; if they do not, he may be confident that such transmutation can never take place. If they are found to belong to different genera, the certainty of no such change becomes if possible still greater.

The botanical or scientific name of a plant, is the name of the genus and the name of the species to which it belongs, joined together; thus, the name of the genus to which the apple belongs, is *Pyrus*; and the name of the species is *malus*; consequently the botanic name of the apple is *Pyrus malus*. The pear also belongs to the genus *Pyrus*, and the name of the species is *communis*; therefore the botanic name of the pear is *Pyrus communis*. The terms *apple* and *pear*, are the English or common names. There is a great advantage in being able to ascertain the botanic names of plants, as well as in making use of them instead of English names (except in the most common of all plants as the apple, pear, currant, &c.) Many plants which are very useful, either for medicine, food, or other purposes, are known in different parts of the country by very different English names; and often the same name is applied to very different plants; thus a name which in one place might be applied to a valuable and useful plant, might in another place be applied to one which possesses no useful properties, or even to one extremely poisonous. Hence the use of English names only, is sometimes attended with dangerous consequences. But in all countries botanists make use of the same botanic names, and such difficulties are thus prevented.

Plants are supplied with nourishment in two ways. The first is what they absorb at the roots through the *spongioles*, which contain a great number of exceedingly small pores. The nourishment which the plant receives in this way is water, with the different substances which are dissolved in it, such as the soluble parts of manures. As soon as it is absorbed, it passes to the trunk or stem, and ascends in it through the sap vessels, which are very fine tubes running lengthwise through it, as well as through all the branches, the stems, and small veins of the leaves. These vessels or pores may be seen easily with a good microscope, by shaving off a thin cross slice from the stem of a plant or from a piece of wood. While this liquid is thus ascending, it is called *sap*. It passes into the branches, and thence into the leaves, which being flat and thin, expose it to the light and air, and it then

undergoes a complete change; the greatest part of the water of the sap passes off into the air in the form of vapor, through very small pores in the surface of the leaf; at the same time, a part of the air is taken into the leaf, and unites with the remaining sap, so as greatly to change the nature and quality, and it is now no longer sap, but is called the *proper juice*, and this is the second way in which nourishment is supplied. It now begins to flow down the branches and stem of the plant through another set of tubes or vessels, and is gradually converted into the solid parts of the plant. Thus we see that a part of the nourishment is taken in at the roots, and a part at the leaves; but all the nourishment which every plant receives, must pass through the leaves before it can be changed into wood. Hence we see that the leaves of plants are quite as important to them as their roots. The knowledge of this principle has a vast number of applications in practice, some of which are of great importance. It teaches us that mutilating plants by stripping them of their leaves while in a growing state, is always an injury to them; hence the stripping of the leaves of corn for fodder, which is in some places practised, should never be resorted to, nor should the practice of topping corn be pursued for the same reason; hence also the practice of cutting off the leaves of mangel wurtzel for feeding cattle, before the roots have attained, or nearly attained, their full size, should not be adopted. But in some cases the leaves are the chief crop, as in the mulberry for silk; in such case it is necessary to avoid stripping them too closely or frequently, in order that the growth may not be too often nor too suddenly checked. The knowledge of this principle also teaches us an easy way to destroy hardy and pernicious weeds. It has been commonly supposed that in order to destroy them, the roots must be destroyed; but this is not at all necessary; if we only destroy the leaves by burying them or cutting off the stems, it is plain their growth is stopped, and if this is continued the roots die. Many years ago, when it was found that the roots of the Canada thistle sometimes penetrate several feet into the earth, many despaired of ever being able to extirpate them; but if they had been acquainted with this principle, they would have known that the roots might have been easily killed by cutting off the supply of nourishment from above, which has since been very successfully done in a multitude of instances.

It is the *proper juice* (above referred to) which generally gives to plants all their useful properties in medicine, dyeing, &c. hence it is necessary in extracting these substances to know in what part of the plant the *proper juice* is to be found.

The course of the small tubes or pores through which the sap and juices flow, may be seen in some plants by cutting off their branches with a very sharp knife and plunging the cut ends into colored water. Thus, if a branch cut from the poke be placed in a dye made from the Brazil wood, and put in a warm place, in a few hours the dye will be found to have run up the stem into the leaves, flowers, and even the fruit. The part of the stem which will be thus colored will show the sap vessels. If now the upper end of a branch be cut, and plunged into the colored water, we shall be able in the same way to trace the course of the pores through which the *proper juice* descends. Some of these pores, however, cannot be discovered in this way, as they will not take in any colored liquor.

All the nourishment which a plant receives, is either by means of the water which is absorbed at the roots, or from the air which is ab-

sorbed into the leaves; all the wood in the largest and heaviest trees is formed in this way. The manner in which water and air is thus changed into solid wood, is indeed curious, but is readily comprehended by those who are familiar with the extraordinary changes shown by chemistry. The fact was very strikingly proved by a philosopher in Holland, who planted a willow weighing *fifty pounds* in a quantity of earth which he also weighed and covered with sheet lead. He watered it for five years with pure distilled water; at the end of which time the tree weighed *one hundred and sixty-nine pounds and three ounces*, and the earth had lost only three ounces.

The quantity of water which passes off into vapor from plants through the leaves, is often very great. Dr. Hales found by very accurate experiments, that a sun-flower which weighed only three pounds, threw off in twenty-four hours, twenty-two ounces of water, or nearly half its own weight. In the same space of time, the Cornelian cherry (*Cornus mascula*) is said to throw off twice its own weight of water. On a warm Summer's day, at a time when there had been no rain for several weeks, Dr. Watson placed a bunch of grass under a bell-glass, and in two minutes the inside of the glass was covered with drops of water like dew which ran down its sides. By weighing the water, he ascertained the exact amount; and from this experiment he was led to conclude that in one day an acre of grass throws off nearly two thousand gallons of water. Some plants when cut wither much sooner than others, owing to the property they have of throwing off the water from the leaves with greater rapidity. Hence by trying this simple experiment, we may find at once how much watering different cultivated plants require. Hence too, the reason why plants may be removed and transplanted with greater success in damp weather when the leaves give off but little water, than in dry weather, when they throw it off rapidly. Hence, too, the reason why, in transplanting trees, if the roots are mutilated or diminished, it is also necessary to reduce in proportion the branches, in order to prevent the leaves throwing off moisture faster than the roots can supply it. Hence also, the reason why mown grass is changed into hay in a few hours in dry weather, while in damp weather no efforts of the farmer will enable him to succeed. The great quantity of water given off by plants, will teach us to avoid the blunder which some people make, of leaving weeds to grow round plants for the purpose of shading them and prevent the ground drying, when in fact they carry off a much greater quantity of water than would dry off the bare earth, besides diminishing the fertility of the soil. Some plants, however, give off but little water, as some kinds of moss, and may therefore in some cases be properly employed in shading the ground.

Thus, by the study of this science, farmers and gardeners may find the reason for the different operations they perform; and may very often know, or be greatly assisted in determining what is necessary and what is not necessary for their success. At the same time they will be enabled to guard against mistakes, by which great injury is often done when least intended.

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*Mr. Baden's "Maryland Corn."*

[FROM THE FARMER AND GARDENER.]

We have inserted in another column a very interesting correspondence between Henry L. Ellsworth, Esq. Commissioner of Patents, Washington, and Thos. N. Baden, Esq., of Prince George's County, Maryland, on the subject of a very superior variety of corn cultivated by the latter. We confess we are pleased to find an officer of our government taking so lively an interest in the cause of agriculture, and for one we tender to this gentleman the sincere, though humble homage of our thanks, and we do this the more readily, as it is not often that we see those filling high stations unbending themselves from the labour of official duties, to promote and foster objects of husbandry. And while we thus obey the dictates of our heart, with respect to Mr. Ellsworth, we must seize the occasion to say that the intelligent discrimination, and long continued perseverance, of Mr. Baden, in improving and bringing this variety of Corn to its present state of perfection, entitle him to the gratitude of every man in whose bosom beats a heart imbued with the sentiments of patriotism. For twenty-two years, he has given all the energies of his mind to the production of a result, which, though pregnant with a large sum of human comfort, had nothing to allure by its splendor—but it had *that* to animate him to his labors, which is infinitely more valuable—the consciousness that he was toiling for the good of his kind,—and while the success which has attended his efforts in increasing the productiveness of this fine variety of corn, will not fail to endear his name to his countrymen, long after he shall have been gathered to his fathers, the recollection of the broad foundation of agricultural good which he has laid, will impart to the winter of his days, that sweetening influence which springs from the possession of honour gained by virtue.

The reader will have observed that Mr. Baden speaks of some seed corn which he furnished to Mr. Law, of Baltimore, to be sent to his friends, the Messrs. Gilfry of Illinois, and we are enabled by the politeness of Mr. L. to lay before our readers the following extract of a letter from one of those gentlemen, by which it will be seen that, by a computation made with care, the Baden corn yielded at the rate of 130 bushels to the acre under their culture in the rich lands of Illinois.

*Extract of a letter of 25th Jan. 1837, from Henry F. Gilfry, of Job's Settlement, McDonough County, Illinois.*

"As we did not start from Baltimore till the middle of last April, and were not fixed here for planting the Baden Corn for a month after the proper season for planting—I regret to state, that although it produced a very abundant crop for the small quantity of seed corn we brought out, (say about two quarts), still none of it was adapted for seed, as it did not attain its full growth; I must, therefore depend on your sending me a further supply of the same description of corn for seeding the present season. What I did plant of it last season answered well for feeding cattle. The way I came by the number of bushels to the acre, was by going through it, and then over ground of a similar size, counting the average ears of corn of the one, and then of the other, from which I drew the following conclusion: that if ordinary corn yield sixty-five bushels, and average two ears to the

stalk that the Baden Corn which we planted (and none loftier ever grew in Job's settlement,) would yield one hundred and thirty bushels to the acre, averaging four ears to each stalk. Now on four stalks taken at random, I counted eighteen good ears, and three small ears, and had I made this my data, the result would have appeared extravagant, although nearer the truth than what I have formerly stated. As advised in former letters, the yield of fodder from our Baden Corn, far exceeded any thing ever seen in this settlement by the oldest settlers."

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[FROM THE NEW ENGLAND FARMER.]

VALUABLE VARIETY OF CORN.

House of Representatives, Feb. 15, 1837.

To G. Fessender, Esq.

Dear Sir:—I am indebted to the Hon. Henry L. Ellsworth, Commissioner of Patents in this City, for a small quantity of Indian Corn, a description of which you have in a letter addressed to myself from Mr. Ellsworth, both of which I now enclose. The package of corn I have sent by John H. Dexter, Esq. of Boston, and will thank you to make such disposition of it as you may deem proper.

I remain, dear Sir, your obedient servant,

ABBOTT LAWRENCE.

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PATENT OFFICE, Jan. 30, 1837.

SIR:—Hearing of some great improvements that had been made in the common corn, I addressed a letter to Mr. Baden, a highly respectable gentleman in Maryland, to ascertain what facts I could on the subject.

His letter is very interesting, and I transmit you a copy of it. The experiment of Mr. Baden, shows most clearly what can be done to improve seeds, by carefully selecting each year the best kind raised. Theoretical opinions sustain Mr. Baden; but few experiments have been tried so successfully. What might be effected for agriculture by similar efforts?

The like efforts in improving the breed of animals, have been crowned with great success, especially in Europe. I avail myself of this opportunity to send you a small sample of the corn mentioned by Mr. Baden. I will only add, that I have conversed with several persons who have planted the "Baden" corn: and the concurrent opinion of all, sustains the statements made in the letter. I have a few samples at the Patent Office, of corn raised in this neighborhood, which has four and five ears on a stalk; and I expect soon some stalks containing six, seven and eight ears. If this corn were generally introduced, how greatly the amount of bread-stuffs might be increased, *without any extra labor*. I hope some public spirited citizen will try to improve wheat, oats, barley and other grains.

I avail myself of the opportunity to mention the introduction of Italian *spring wheat* with great success. A friend of mine, in Connecticut, raised the last year, forty bushels on an acre. This grain is heavy; makes good flour; yields well; and the crop avoids all the danger of winter freezing. I have ordered a quantity of this corn and wheat

to be shipped to Indiana, and intend to try both on the fine soil of the Wabash valley, the ensuing summer.

I am yours, very respectfully,

HENRY L. ELLSWORTH.

N. B. Be careful to plant this corn in a place by itself. When good seed is planted in a field with poor seed, the former will degenerate.

H. L. E.

[Copy of Mr. Baden's Letter.]

NEAR NOTTINGHAM, PRINCE GEORGE'S CO. Jan. 26, 1836.

SIR:—I received yours of the 14th, making inquiry respecting the "Maryland corn," which you understood I had raised. I have the pleasure to say that I have brought this corn to its high state of perfection, by carefully selecting the best seed in the field for a long course of years, having especial reference to those stalks which produced the most ears. When the crop was husked, I then made a re-selection, taking only that which appeared sound and fully ripe, having a regard to the deepest and best color, as well as the size of the cob. In the spring, before shelling the corn I examined it again, and selected that which was the best in all respects. In shelling the corn, I omitted to take the irregular kernels at both the large and small ends. I have carefully followed this mode of selecting seed corn for *twenty-two or twenty-three* years, and still continue to do so. When I first commenced, it was with a common kind of corn, for there was none other in this part of the country. If any other person undertook the same experiment, I did not hear of it; I do not believe others ever exercised the patience to bring the experiment to the present state of perfection. At first, I was troubled to find stalks with even *two good ears* on them, perhaps one good ear and one small one, or one good ear and "a nubbin." It was several years before I could discover much benefit resulting from my efforts—however, at length the quality and quantity began to improve, and the improvement was then very rapid. At present, I do not pretend to lay up any seed without it comes from stalks which bear four, five, or six ears. I have seen stalks bearing eight ears. One of my neighbors informed me that he had a single stalk with ten perfect ears on it, and that he intended to send the same to the museum at Baltimore. In addition to the number of ears, and of course the great increase in quantity and unshelled, it may be mentioned, that it yields much more than common corn when shelled. Some gentlemen, in whom I have full confidence, informed me that they shelled a barrel (10 bushels of ears) of my kind of corn, which measured a little more than six bushels. The common kind of corn will measure about 5 bushels only. I believe I raise double or nearly so, to what I could with any other corn I have ever seen. I generally plant the corn about the first of May, and place the hills 5 feet apart each way, and have two stalks in a hill. I can supply you with all the seed you may need, and I suppose I have now in my corn-house, 50, and perhaps more stalks with the corn on them as it grew in the field, and none with less than four, and some six or seven ears on them. I will with pleasure send you some of these stalks, and also some seed corn, if I can get an opportunity.

Early last Spring, I let George Law, Esqr. of Baltimore city, have some of this seed corn; he sent it to his friend in Illinois, with instruc-

tions how to manage it. A few weeks since he informed me that the increase was one hundred and twenty bushels on an acre; that there was no corn in Illinois like it, and that it produced more fodder than any other kind. I have supplied many friends with seed corn, but some of them have planted it with other corn, and will, I fear, find it degenerate.

I have lately been inquired of, if this corn was not later than other kinds? It is rather earlier; certainly *not* later. Corn planted in moist or wet soils will not ripen so quick as that which is planted on a dry soil. In the former, there will be found more dampness in the cob, although the kernel may appear equally ripe in both. In the two last years, the wet seasons have injured much corn, that was too early "lofted" or housed.

I believe I have answered most of your inquiries. I hope I have not exaggerated—I have no motive for doing so. I raise but little corn to sell, as tobacco is my principal crop. Should I fail to send you some seed this Spring, I will next Summer gather some stalks with the corn, fodder and tassels, and all as they grow, and send to you, that you may judge yourself of the superiority of this over the common kind of corn. Yours, &c.

THOS. N. BADEN.

### *Rotation of Crops.—Potatoes and Corn.*

[FROM THE FARMER AND GARDENER.]

Rotation of crops, is certainly among the most valuable of the modern improvements in agriculture. The scientific researches of many farmers have enabled them to discover some of the principles of vegetation, formerly but little understood. And it is believed that they will generally soon be fully convinced by experiment of the great benefits to be derived from rotation of crops. The different kinds of vegetables require nutriment peculiar to each class, and by planting the same kind on the same soil for a number of years in succession, the vegetables or plants degenerate for the want of their peculiar aliment; or as the common expression is, the soil becomes exhausted. It is therefore conceded to be an injudicious practice to cultivate the same crop, upon the same soil, for even two years in succession.

The same remark is applicable in horticulture; although a plentiful supply of manure annually, may afford some remedy for a previously exhausted soil.

By a judicious succession of crops, and the frequent use of that most important instrument to farmers, the plough, the fertility of the soil may be maintained. So many valuable essays have of late been published upon this subject, that we will not extend our remarks; but beg leave to refer to that of J. Hamilton Conper, republished in the *Northern Farmer* of the 9th March, 1833, as containing much valuable information, and as being worthy of an attentive perusal. Connected with this subject is the adaptation of the different soils to the various kinds of plants. Many skillful farmers acquire some practical knowledge of this subject, without understanding its true principles. Indeed, these principles cannot be well understood without the aid of the science of chemistry. Chemical science is indispensable to the Physician; but it falls not exclusively within his province. The practical farmer will find it of vast service in his pursuit. Its study ought therefore to be encouraged.



By ascertaining the food which different kinds of vegetables require, and the nutritious qualities of the various soils, the agriculturist is enabled to decide how he can, generally, produce the largest crops, with the least labor and expense.

He cannot have sufficient foresight to guard against unpropitious seasons; but acting upon enlightened principles and correct theories, his prospects of a good harvest will seldom be cut off. Our present object is to submit a few remarks upon two of our most essential agricultural products, potatoes and corn.

In this section, we raise no vegetable of greater profit or more general use than the potato.—And its annual consumption seems to be yet on the increase. We learn from aged persons, that some fifty or sixty years ago ten or fifteen bushels of potatoes were considered as a large crop for each farmer; and at that period, it was as uncommon for a slaughtered swine to weigh 250 lbs. as it now is, to weigh seven or eight hundred—Now, a thousand bushels or even fifteen hundred is not an uncommon crop, upon a farm of one hundred and fifty or two hundred acres.

It has been believed by many, that high, sandy, or gravelly soils are best adapted to the growth of potatoes. But the modern theory, proved by experiment, is, that a low cold bottom, or clay-pan is preferable. I have for several years cultivated this vegetable upon a low, level, clay-pan, taking care to have proper drains in case of heavy rains; and find that it not only yields largely, but that the quality or flavor of the potato is superior to that of those produced on high, sandy soils. A cold bottom is more congenial to them. And it is generally known, that in a cold, wet season, they flourish better, than in a very warm and dry one. But when planted in low lands, the drains should always be kept open, to prevent overflowing.

It is said that in some parts of Ireland, famous for excellent potatoes, the potatoes are planted in low, and boggy lands, in beds, between which a ditch or drain is cut; and that the mud or most nutritious portion of the soil which gradually collects in these ditches, is taken up to cover the potatoes. The practice, which many farmers are adopting, of laying out their low and marshy lands into beds rising in the centre, of four or five rods in width, with intervening drains, running towards a common outlet, will prove highly beneficial; and when there shall be a great increase of population, and the value of our lands shall be greatly enhanced, this practice will be adopted by all good farmers. It will then be admitted by all, that our valleys, and swamps contain the most fertile soil. In these, have been collecting for ages, decomposed vegetable matter, which constitutes the deep black soil. This kind of soil conveyed on to high sandy barren land, with a mixture of animal manure, will convert the latter into fruitful fields. And the fertility of the low land is increased by spreading upon its surface, loose sand or gravel from the hills.

The old practice of making the potato hill in an oval form or the shape of a sugar loaf, is very censurable. The same remark is applicable to the corn hill. Because, hills so formed, do not absorb so much moisture, when the rains descend, as hills flat at the top.

It is believed that a former practice of planting small potatoes, is now universally condemned. But many are yet of opinion, that it is as judicious to plant cut potatoes, or slips, or the eyes, as whole potatoes. This practice is contrary to the course of nature. Nature is always right, in all her operations. The Farmer should take nature

for his great and unerring guide.—Hundreds of various theories have been published upon this important point. The result of our observations and reflections, respecting it, is, that it is always best to plant the best potatoes whole, except those containing too many eyes, of unusually large size. The latter may be divided. I raised a potato, perfectly sound, of an oval form, weighing two and one half pounds. This I cut into twelve pieces, which from twelve hills, yielded two bushels. If slips are planted, the plants or sprouts come up more slender and feeble. In favorable seasons, they may often look very well, but not so well as those from the whole potato. Care should be taken to prevent the growth of too many sprouts or stalks. Four or five in a common hill are sufficient. The size of the potato depends very much upon the number of stalks, and the size as well as richness of the hill. Potatoes degenerate by means of an improper mode of cultivation, and not from the climate. This vegetable of inestimable value contributes most to the health, growth and fatness of cattle, after being boiled, or steamed. It ought never to be given to swine in a raw state, unless, possibly, in the warmest season of the year, after being partially dried.

The common practice of mutilating corn stalks, or “topping corn,” before the ear has come to maturity, ought to be condemned. It may be difficult to account for the origin of so singular a practice. But we trust that its termination will not be at a day far distant. It stands opposed to reason and philosophy. But our suggestions upon this important subject must be deferred until a more convenient time.

W. CLAGGETT.

Portsmouth, February 19.

### *Rise and Progress of Agriculture.*

[FROM THE FARMER AND GARDENER.]

The antiquity of this art is undoubtedly beyond that of all others. From the earliest accounts of the eastern nations, we have reason to think, that agriculture had been understood by them to considerable perfection: seeing they were always supplied, not only with the necessities, but the greatest luxuries of life.

As soon as the descendants of Abraham were settled in Palestine, they became husbandmen, from the chiefs of the tribe of Judah, to the lowest branch of the tribe of Benjamin. High birth or rank did not at that time make any distinction; for agriculture was considered as the most honorable of employments.

The Chaldeans, who inhabited the country where agriculture had its birth, carried that valuable art to a degree of perfection unknown in former times. They cultivated their land with great assiduity, and seem to have found some means of restoring fertility to an exhausted soil, having plentiful harvests in succession; on which account they were not obliged, as their predecessors had been to change their situation, in order to maintain a sufficiency for themselves and their numerous flocks and herds.

The Egyptians, who, from the natural fertility of their country by the overflowing of the Nile, raised vast quantities of corn, ascribed the invention of the art of agriculture to Osiris. They also regarded Isis, their second deity, as the discoverer of the use of wheat and barley, which before grew wild in the fields.

It is also related of the ancient Persians, that their kings laid aside their grandeur every month to eat with husbandmen. This is a striking instance of the estimation in which they held agriculture: for at that time other arts were practised among the people in great perfection, particularly those of weaving, needle-work, and embroidery. The precepts of the religion taught by the ancient magi, or priests, included the practice of agriculture.

The Phœnicians, better known in scripture by the name of Philistines, were remarkable for their attention to, and skill in agriculture; but finding themselves too much disturbed and confined by the incursions and conquests of the Israelites, they spread themselves through the greater part of the Mediterranean Island, and carried with them their knowledge of the art of cultivation.

The Athenians taught the use of corn to the rest of the Greeks. They also instructed them to cultivate the ground, and to prepare it for the reception of the seed. The Greeks soon perceived that bread was more wholesome, and its taste more delicate than that of acorns and the wild roots of the field. Hesiod was the first we know of among the Greeks, who wrote on this interesting subject. He lived about nine hundred years before the Christian era.

The ancient Romans esteemed agriculture so honorable an employment, that the most distinguished Senators at their leisure intervals applied themselves to the cultivation of the soil. Numa Pompilius, one of their kings, was much distinguished for his skill in agriculture; and such was the amiable simplicity of those times, that their greatest warriors and legislators were often called from the active labors of the field to the highest offices of the State. Regulus, the celebrated Roman General, when in Africa, requested of the Senate to be recalled, lest his farm might suffer for want of proper cultivation in his absence; and the Senate wrote to him for answer, that it should be taken care of at the public expense while he continued to lead the armies. Cato the censor, Varro, Virgil, Columella, and other distinguished Romans wrote on the subject of agriculture.

In China, a day is still annually appointed when the Emperor goes in solemn procession to a field, where he shows his sense of the inestimable benefits of agriculture by undertaking for a short time, the laborious occupation of directing the plough in person.

Previous to the establishment of the Romans, the cultivation of the soil was but little understood in Britain. By their assistance, however, it experienced considerable improvement, insomuch, that the Britons were enabled annually to export large quantities of grain. Subsequent to this period, it has been continually advancing in its progress, and has now attained a high degree of perfection. Societies have of late years been formed for the purpose of encouraging this and other useful arts; and a plan has been proposed for introducing the study of agriculture into schools and making it a necessary part of national education.

In the year 1576, a period of difficulty and distress, France began to pay particular attention to this important subject. Prize questions were annually proposed by the academies of Lyons, Bordeaux, and by the society instituted for the improvement of agriculture in Brittany. About this time, it was also greatly encouraged in Russia, Sweden, Denmark, Germany and Italy; in the last mentioned country, a private gentleman, about 80 years ago, left his whole fortune to the establishment and support of an agricultural society.

Whether we consider agriculture as a means of procuring as well the necessities as the luxuries of life, of providing a security against the aggravated calamities of scarcity, famine and disease; or of engaging the mind in active and extensive pursuits of general knowledge, it is one of the most important and useful arts which have employed the attention of mankind. Its theory is, in a great measure, dependent on several branches of science, such as natural history, chemistry, experimental philosophy, and mechanics, all of which may be successfully applied to its advancement; and without a competent knowledge of these, it cannot be properly understood. Its practical part, however, may be carried on, independently of scientific experiments. No person therefore need be deterred from attempting any improvements, because he is not conversant with the more abstract parts of physical knowledge.

The flourishing state of manufacture is greatly dependant on that of agriculture; because the price of those commodities obtained by labor, is not only closely connected with that of the necessities of life, but some of the most considerable articles of manufactures are originally supplied by agricultural productions, such as wool, flax, hemp, rape-seed, tallow, &c.

The successful advancement of the rural art depends on two circumstances: the one, its improvement by discovery or invention; the other a more extensive practice of such improvements when fully demonstrated. The former is effected by the contrivance of more perfect machines and implements of husbandry, which facilitate the progress of labor; the introduction of new articles of profitable culture, and the most advantageous mode of treating those which have already been cultivated, though in a defective manner. The latter, namely the practice, relates not only to future improvements, but likewise to those which, though generally known, have been either wholly neglected, or adopted only in peculiar places.

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### *On the suitableness of Warm Climates for Wine Making.*

[FROM THE FARMERS' REGISTER.]

*Dear Sir:* I have read with much pleasure, in your most valuable *Farmer's Register*, (No. 10.) the extracts from "an essay on the climate of the United States," and feel disposed to make a few observations on some parts of it.

I shall not try my hand at explaining the causes why the eastern portions of our continent are much colder than the same parallels of latitude on the western coast of Europe. These, I thought, were matters pretty well settled, so far as we can see into them. The causes of the various winds are more unknown, at least to me, and therefore I shall say nothing about them. The author's views relative to the culture of the vine in the United States, come somewhat more within the narrow limits of my studies and experience. It is but too true that "the efforts made at different periods, and in various parts of the country, to attain this object, have hitherto been so unsuccessful, as to induce a very general belief, that there is something in our soil or climate, so unfriendly to the vine, that it can never be cultivated with success." This unfriendliness, it appears to me, is more in the climate than in the soil; and yet, although climate cannot be corrected



by us, the soil can be in some degree, and we might do pretty well, if it were not that much too great quantities of rain fall in this country, during the summer months, particularly in the southern states. In a dry summer, we have good grapes and a tolerable crop, which might be very good in a soil sufficiently calcareous. It would be a most strange anomaly, that the vine could not be cultivated in a country which has, perhaps, more than any other on the face of the earth, indigenous vines growing almost every where, and in very great variety. Although we may, among this variety, find several that may be introduced into cultivation with great advantage to the cultivator, yet, I would not that our efforts be limited to the native kinds, alone—for the cultivated ones of Europe and other parts of the earth, offer advantages which never have been yet obtained from the native one. The exotic kinds, many of them grow very well in our country, and even more luxuriantly than in most parts of Europe. It is so true, that for a long time, I attributed the rot in the grapes, to that very luxuriance of the vines; but, the having planted some, with equal want of success, in very poor sandy land, has much weakened that opinion. I still hope that the remedy, at least a partial one, might be found in calcareous earths.

The author of the pamphlet, whose review I am considering, seems like many other writers on the subject, to think it an insurmountable objection to the making of wine, that the grapes ripen in the hot summer months, and thereby, the fermentation going on too violently, the wine becomes acid. I have made wine when the thermometer was at 90 deg. and upwards, and my wine has never turned acid in consequence of it. I certainly never have experienced any difficulty on this account. But if a due and moderate degree of fermentation could not be obtained in a temperature so high, still the difficulty would be easily overcome. We surely can obtain a lower temperature by digging a deep cellar for it. This is, it is true, an expensive structure; but it is insignificant when contrasted with the profits of the successful culture of the vine.

The author says: "wine, I believe, is never made within the tropics." Very little is made within the tropics, particularly on the eastern part of the globe, relative to our continent; but, the cause of this, is probably more to be sought in the indolence of the inhabitants of warm climates, and also, in the Mahometan prohibition of the use of wine, than in any absolute difficulty. I have now before me a French book—"Topographie de tous les vignobles connus," &c. "Par At Julien, auteur du Manuel du Somelier," &c. In this most interesting and excellent work, I find not only great crops of excellent wines are made in Greece, Egypt, Palestine, and still more southern tracts in Africa and Asia; but, I also find the vine cultivated in Arabia, between the 12th and 30th of latitude. It is also found in Abyssinia, and also in several of the Oases of the great deserts. Grapes are also successfully cultivated, and wine made in some of the West India Islands. In Guiana, "the vine, the pomegranate, and the fig tree, are the only fruit trees transported from Europe, which have had success in some parts of the country; but the grapes rot during the rainy season, and are devoured by the insects during the hot weather." This country extends from the 2d to the 9th degree of north latitude. On the western side of the continent, in latitude south, 8° and 9°, "the province of Truxillo has numerous vineyards in full success." "In the government of Cusco, wines and brandies are one of the principal sources of

wealth in the Corregidorship of Callahuas." "In Peru and in the Tucuman, the vine is very successfully cultivated." It is so likewise in many parts of Chili, Mexico, and other southern countries. It is to be observed that, although the wines made in those warm climates are not all of the first quality, yet many are in very high repute, and bear high prices.

From all these facts, we ought to gain courage. We should persevere, and probably, success will finally crown our endeavors. Public aid should certainly be afforded for the purpose of making the many and expensive experiments necessary to insure a prosperous result; for this would redound to the general benefit in morals, as well as pecuniary and political and commercial advantages.

I fear, Mr. Editor, the matter, as also the matter of the above rude lucubration, may not accord with the taste of the generality of your readers; but, yet, I think with you, that if our distinguished and talented men, were to turn their thoughts to agricultural improvements, meteorological studies, and the introduction of valuable articles of culture, and less to party squabbles, &c. we would do much better than we do. While I am waiting for this good change in our views and exertions, I continue to be truly yours,

N. HERBEMONT.

*Columbia, S. C. Feb. 15th, 1837.*

### *The Morality of High Prices.*

[FROM THE NEW YORK JOURNAL OF COMMERCE.]

There have been many good people who thought it wrong to exact the market price, when that price was extremely high. Their consciences have been especially wounded when the dear article was a necessary of life. We have known good men who would never take any more for food, or fuel, or hay, when these articles were scarce, than when an ordinary supply existed. When men apply these remarks to themselves, no one will be likely to blame them for their scrupulousness. But when they lay blame upon their neighbors, it becomes necessary to inquire whether their opinions are founded in truth or error. Such persons have generally a notion that every article has in itself an intrinsic and absolute value, which is not susceptible of being changed by the greater or less quantity of it which may be in market. If there be any thing at all of truth in this idea, it is but little. Prices are not regulated by intrinsic value. What is intrinsic value? Let those who base their theory of morals on intrinsic value, examine that foundation, and if they can, give us its size and shape. The value of a pint of water might sometimes be the same as the life of a man; yet generally it has so little value that no price at all is fixed upon it, and not unfrequently it is a nuisance, and money is frequently paid to get rid of it. Yet according to the general notion of intrinsic value, a pint of water has as much of it in one case as in another. It will be distinctly seen, therefore, that intrinsic value, if there be any such thing, is not the measure of price. Those articles which have most of it, or which are most essential to our comfort and happiness, are by the goodness of the Creator made so plenty as to cost but little.

All persons admit the justice of some variations in price. But from great fluctuations they dissent. If an article is somewhat scarce, it may rise somewhat; but if extremely scarce, it must not rise by the same rule. All such reasoning is without an understanding of the va-

lue of price. It is the great regulator of consumption, always taking care that in time of plenty nothing should be lost, and that in time of scarcity a pittance should be on hand to the last day of need. The condition of the wretched crew and passengers on board the ship *Diamond*, which arrived from England the other day, is an illustration of the value of high prices. As their voyage was extended beyond the expected time, the provisions of the less provident, or less able, became exhausted, and they began to buy of those who had stores remaining. The voyage was extended to a hundred days, thrice the time which was at first anticipated. All this time prices were rising, until a potato was valued at a sovereign. The supplies on board the ship lasted to the end, and at the end not enough remained to sustain them another day. Of one hundred and eighty passengers, only seventeen died. If the price of the provisions on board had not been advanced above what it was when the ship sailed, they would probably have all been consumed, and every soul on board have perished.

Price is the regulator of consumption. If there is a scarcity, it draws supplies from a distance and deals out for consumption with a sparing hand. It is the Creator's prudential agent. Every effort to deprive it of its power of vibration, is an effort to counteract plans of the highest benevolence. The history of our own corn market during the present year, illustrates the usefulness, nay absolute necessity of high prices. If prices had not advanced, and largely too, there would not at this moment have been a barrel of flour in this market. If the price of flour had been kept down to six dollars, and of other articles in proportion, half the inhabitants of New York would have perished with starvation, or have been compelled to quit their homes and go where food could be had. Our supplies from the ordinary sources were not more than sufficient for half the year. If prices had not advanced, what would have brought relief? But high prices have penetrated into the interior of our own country, far beyond the circle of our ordinary supplies, and brought forth great quantities of provisions through our canals and rivers. The influence has extended even to Europe, and brought a fleet of ships laden with grain; and after all we have but a scanty supply. Shall we quarrel with high prices, when they have saved our lives?

This is a simple view of the matter, but it illustrates the use of prices, and shows how little of intelligent benevolence there is in all the complaints which are uttered against those who do business at market prices, whether they be high or low.

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### *Experiments of various Manures on Potatoes.*

[FROM THE GENESEE FARMER.]

The following extracts from "*Dickinson's Agriculture*," will show that in Great Britain, particular attention has been given to salt as a manure. To show its utility as a manure in a more clear point of view, the following experiments were made by the Rev. Mr. Cartwright.

A certain portion of soil (ferruginous sand brought to a due texture by a liberal covering of pond mud) was laid out in beds one yard wide and forty long: of these, 25 were manured, the first excepted, as follows:

No. of Beds.	Kind of Manure applied.	Product of Potatoes.
1	No manure, . . . . .	157
2	Salt, $\frac{1}{4}$ peck, . . . . .	198
3	Lime, one bushel, . . . . .	150
4	Soot, one peck, . . . . .	192
5	Wood ashes, 2 pecks, . . . . .	187
6	Saw dust, 3 bushels, . . . . .	155
7	Malt dust, 2 pecks, . . . . .	184
8	Peat, three bushels, . . . . .	159
9	Decayed leaves, 3 bushels, . . . . .	175
10	Fresh dung, 3 bushels, . . . . .	192
11	Chandler's graves, 9 lbs. . . . .	220
12	Salt, lime, . . . . .	167
13	Salt, lime, sulphuric acid, . . . . .	175
14	Salt, lime, peat, . . . . .	183
15	Salt, lime, dung, . . . . .	199
16	Salt, lime, gypsum, peat, . . . . .	201
17	Salt, soot, . . . . .	240
18	Salt, wood ashes, . . . . .	217
19	Salt, saw dust, . . . . .	180
20	Salt, malt dust, . . . . .	189
21	Salt, peat, . . . . .	171
22	Salt, peat, bonedust, . . . . .	178
23	Salt, decayed leaves, . . . . .	187
24	Salt, peat ashes, . . . . .	185
25	Salt, Chandler's graves, . . . . .	185

"The quantity of ingredients the same as when used singly.

On the same day the whole was planted with potatoes a single row in each bed; and that the general experiment might be conducted with all possible accuracy, each bed received the same number of sets.

On the 21st of September, the potatoes were taken up, when the produce of each row was according to the annexed table.

It is observed as being remarkable, that of ten different manures, most of which are of known and acknowledged efficacy, *salt*, a manure hitherto of an ambiguous character, is superior to them all, one only excepted, and that when used in combination with other substances, it is only unsuccessfully applied in union with that one, namely, *Chandler's graves*, no other manure seemingly being injured by it: possibly its deteriorating effects on *Chandler's graves* may be owing to its antiseptic property, which retards the putrefactive process by which animal substances undergo the changes necessary to qualify them to become the food of plants. This, however, he cannot, from any appearances in the soil when the plants were taken up, assert to have been the case. The extraordinary effects of salt, when combined with soot, he thinks are strikingly singular: there is no reason to suppose these effects were produced by any known chemical agency of soot and salt on each other. Were he to guess at the producing cause, he should conjecture it to be that property of saline substances by which they attract moisture from the atmosphere; for he observed those beds where salt had been used were visibly and palpably moister than the rest, even for weeks after the salt had been applied, and this appearance continued until rain fell, when of course, the distinction ceased. This property of attracting moisture had greater influence possibly, on the soot than on any of the other manures, as soot



from its acrid and dry nature may be supposed to require a greater proportion of water to dilute it, than those substances which contain water already. It may be proper to observe, that on those beds where salt had been used, the plants were obviously of a paler green than the rest, though not less luxuriant: a circumstance which he thought worth noticing, and which he considered, though erroneously (as appeared by the event,) to indicate a want of vigor, which would be felt by the crop. It was observable also, that where salt was applied, whether by itself or in combination, the roots were free from that scabbiness which oftentimes infects potatoes, and from which none of the other beds (and there were in the field nearly fifty more than what made part of these experiments) were altogether exempt.

### *Silk and Sugar-Beet Culture and Manufactures.*

[FROM THE NEW ENGLAND FARMER.]

I send you some few notes relative to Silk and its culture, and the Sugar-Beet. The progress making in both these branches in France and other countries at the present day, offers new encouragement. By continued perseverance, which is one of the most distinguishing traits of the American character, we have the assurance of perfect success, and in the end it is expected that these two branches will constitute to the northern and middle States of the Union, a mine of inexhaustible wealth.

The production of food and of clothing, are the two most important sources of wealth to a nation. Silk and the Sugar-Beet are the two all engrossing topics which have engaged the attention of the French nation of the present day, as I am assured by a letter of a very late date, from the most authentic source in that country. The stock of the Chinese mulberry is exhausted in the vicinity of Paris, and its price has risen to more than double what it was last year. Such has been the increased demand and reputation of this plant of late; and even the seed of the White Mulberry commands at Paris, a price of 60 francs a pound. Of these facts I am very lately assured by the Chevalier Soulange Bodin, whom I consider the best authority in France.

Italy is advancing, though now in the rear, if we may believe all accounts. Aided as they are by the exertions of M. Bonafoux, they must advance in time. The silk culture, by the aid of the present enlightened Pacha, is also, from all accounts, making considerable advances in Egypt.

I shall endeavor to prove that the comparative high price of labor in America, offers no discouragement. The zeal and enterprise of our people will enable them to overcome all obstacles, the difference in the price of labor must be measured according to the amount of labor performed, and the talent and ingenuity which are brought into action.

The improved *power looms* for weaving silk of the most perfect construction, are of American invention. The experiment has since been tried in England but with only partial success.—I have seen Gay's power looms at Nantucket for weaving plain silks, which can weave pongees at the rate of 24 inches in a minute, and of the most perfect manufacture. Ordinarily however, they seldom come up to this speed. A woman can tend two looms. The President of that company ("the Atlantic Silk Company,") to whom the public are greatly indebted for his unwearied perseverance, has lately assured me that

their success in the manufacture, exceeds his most sanguine expectations.

Last summer, S. V. S. Wilder, Esq. called on me—a gentleman of great intelligence and the strictest veracity—who owns a very large farm in a neighboring town, though principally he resides as a merchant in the city of New York. He appeared anxious that people should begin aright. On his farm he is setting out the mulberry on the hills, and from his extensive observations and knowledge of the silk business, in which he was constantly engaged during a residence of twenty-two years in France, he is confident that the hills and uplands are best suited to the mulberry.—This confirms my previous statements. He observes to his certain knowledge, that in low grounds and near ponds and meadows, the leaves are liable to become spotted and mildewed, and if given to the insects the sure sources of disease.

These low grounds are moreover exposed to the destructive frosts of winter, and of summer, and are better adapted to the growth of the sugar beet.

He relates an account of the growth, progress, and profits of an orchard of mulberry trees, set out by a crape manufacturer, and a friend of his, of Lyons, at Fontaine, about 15 miles from Lyons, about the year 1807. He was invited by his friend to visit this plantation at its formation at that time. Here were 60 French acres, (about 75 English acres) just set out with mulberry trees at the rate of 200 trees to the French acre. Six years after, he was invited by his friend to visit this plantation again, and was then informed that he had just sold the leaves on the whole plantation for one franc for each tree, or about \$2,000 for the whole, to the gatherers. These are another class, who come sometimes even from remote sections, with their whole families in wagons, and well provided with the essential means of purchasing the leaves on the trees, and with every needful requisite for making silk; shantees or sheds however are usually provided by the owner, and special provision is made in the contract, that the leaves of the tip ends of the twigs shall always be preserved to retain the sap and preserve the vigor of the tree. About four years afterwards, by invitation, Mr. Wilder made another visit at this plantation from Lyons to Fontaine. The crop had at that precise time, just been sold on part of the plantation at three francs per tree. About seven years after, Mr. Wilder being again invited by his friend to visit the same plantation at the epoch of gathering the leaves, he found that the whole crop, from 10,000 trees had been sold to the gatherers, on the trees, for 5 francs per tree, or about \$10,000 for the whole. And this plantation bid fair to produce an equal or superior amount of foilage for a long series of years.

It must be remarked however, that the price of leaves varies somewhat in different years, and is governed in some measure by the demand of silk. This amount of produce may be regarded as a great estate to the fortunate possessor, in a country like France, where a man may live independent and comfortable on one half the income which would be required in America or in England. It is stated that many of the English go to France, and especially to Paris, there to reside on account of the cheapness and economy of living.

Mr. Wilder states it also as a fact, which long experience has proved in France, that more pasture is produced beneath the shade of the mulberry trees, than in the open ground. All the reason for this, which I can assign is, that the roots of the mulberry tree strike down-

wards; other plants may therefore, with reason, grow well beneath its shade, especially those whose roots do not descend deep; besides the tree serves during summer to protect the surface from the scorching sun.

This mode of raising the mulberry tree is exceedingly simple, but evidently it is not that which is most approved at this day, either in France, in Turkey, in China, or in India. The system of raising them in hedge-rows, seems now the most of all approved. And even in Italy, at this day, M. Bonafoux, the director of the Royal Gardens at Turin, and the celebrated writer on silk, whose translated works are so well known with us, has recommended hedge-rows, and has made extensive experiments, and his authority I deem equally high as that of the celebrated Dandolo, whose disciple he was, and especially as his writings are of a more recent and of a later date.

John P. Cushing, Esq. a gentleman who has resided many years in China, has stated that the most approved mode of cultivating the mulberry, as practiced in many parts of that ancient and extensive empire, consists in keeping them low by annual prunings, like plantations of Raspberries. This system has at a late date, attracted the attention of Mr. Bonafoux, and has been adopted in practice and highly recommended by him. In an article which I find recorded in the *Annales de l'Institut Royal Horticole de Fromont*, vol. iii. pp. 341 to 348 inclusive,—this celebrated writer and master of the art recommends the practice of raising mulberries in low plantations, and in close and compact order as in China, or as he terms it, in *prairies*. The Chinese mulberry, *morus multicaulis*, or as he terms it, *M. cucullata*, had early attracted his attention after its first introduction to France, from the peculiar luxuriance of its growth and produce, the extraordinary size of the leaves, and the facility with which they are gathered, and the promptitude with which they are renewed, the facility also, by which it is increased from layers and from cuttings. He adds, “we can say with assurance, that the mulberry of the Philippines, [of China] is not more sensible to the cold of our countries, than the White mulberry.” He then proceeds to state, that in the memorable winter of 1830, which was one of unexampled severity, the branches were indeed destroyed at their summit, as were also those of the common species; but they failed not to re-establish their growth in short space of time.

M. Bonafoux speaking further of the merits of the new plant, proceeds to say: “The advantages being already stated, it remained only to examine how far the leaves possessed the qualities requisite for the nourishment of silkworms. I made therefore, two comparative experiments in the education of the silkworms, numbers and all circumstances in the two cases being equal. The worms fed constantly with the *morus cucullata* [*morus multicaulis*] consumed rather less in quantity than was consumed by the worms which were fed altogether with the *murier blanc*, [white mulberry] and I obtained from each, several thousands of cocoons, which offered no perceptible difference in regard to strength of fibre, fineness, or weight.”

M. Bonafoux found that a journal of land of Piedmont, set out in close order, or in prairie, with 5000 cuttings of *morus multicaulis*, produced about 50 quintals of leaves in the second year, while it would have required, at least 100,000 plants of the white mulberry, of one or two years growth from seed, to produce the same quantity of food on the same ground. In the third year, the same plants on that same

ground, produced him about 100 quintals of leaves, and he supposes that in a very short period after the quantity produced on the same journal of land, would be increased to 200 quintals, and that this might be the maximum. The *journal* of Piedmont is 100 *tables*, or about a third of a French *hectare*, or about 8-10 of an English acre. Thus, according to this calculation, an English acre would soon produce 25,000 lbs. of leaves, enough with the best management and the strictest economy in feeding and reeling, to produce 312 lbs. of silk. Again, the plan he proposes is to raise the plants from cuttings, the first year in close order. And in autumn, or early in the following spring he recommends to set the plants in rows 2 or 3 feet asunder, and a foot and a half distant in the row. And he moreover, particularly directs to set the plants 8 or 10 inches deep at least, as thus they will throw out new and more abundant and numerous roots on every side.

These plants are shortened down to near the surface of the ground early in Spring, to make them throw up new and numerous shoots of the most luxuriant growth, 5 to 7 feet. The ground during summer to be kept cultivated, and the plants in the spring to be annually pruned down. M. Bonafoux recommends cuttings of 5 or 6 inches, each furnished with 3 or 4 eyes. In this he is right, as cuttings of this length are sure to live. Usually with us, but 2 eyes are left to each cutting, from motives of economy; but when an early and severe drought occurs, and before the cuttings have time to take root, the danger of a total loss by reason of the short cuttings becomes great except only in moist grounds.

After being cultivated in this mode for 15 or 20 years, he has recommended to take up the plantation to clear the ground of all roots, and to cultivate with vegetables for one or more years, new plantations being formed in the meantime.

Among the advantages enumerated by him, which this mode promises to cultivators, and especially when they employ the new mulberry, *morus multicaulis*, in preference to the white mulberry, are the following: 1. The winds have less power or action on the trees. 2. A less depth of soil is requisite than is required for standard trees. 3. Women and children may collect the leaves without danger, and with much greater facility and promptitude than from large trees. 4. The vegetation of the mulberries will be earlier in the prairies, and by reason of this the worms may complete their labors before the greatest heats of summer. 5. The absence or scarcity of fruit will facilitate the gathering of the leaves which will not be soiled, to the injury of the insects when consumed, or by causing fermentation in the litter. 6. This early vegetation of the mulberries, and the promptitude with which their foliage is renewed, may render it possible to make two successive crops in a year, without sensibly injuring the vigor of the plant, which will again recover a new crop of leaves before winter.

In fine, this culture offers at the same time an increase of production; diminution of expense; economy of land; and to all these and other advantages which M. Bonafoux has enumerated, I also will add, that the economy in time is another very important consideration, as the plantations in this mode are sooner rendered productive, than from trees at an extended distance. Thus the prolonged and expensive outlay is saved, and the tedious cultivation of many long years.

With regard to the White mulberry, I will suggest the opinion that only one crop of leaves can probably be gathered in our climate in a season, its growth being slow, a second crop would too much exhaust



the tree, but in warmer climates as in Tuscany, two crops may be obtained even from that tree in the same season. As to the Osage Orange, I have urged last summer on some at Philadelphia, that trials should be made of the leaves, by feeding the silkworms exclusively on them alone, throughout their various mutations. But though I understand that the worms eat them with avidity, they were not fed with them exclusively, and I cannot yet learn that the decisive experiment has been fairly tried. The tree seems perfectly hardy on my hill, where it has stood uninjured and unprotected during 8 years. Yet though I believe it to be full as hardy as the mulberry, I am informed on the best authority, that in the valley of the North river and at Albany, and in the same latitude as with us, that the maclura or Osage Orange is almost invariably destroyed down every winter, as are also some other hardy trees; a proof that that climate during winter, is very different from ours. That climate however, must be equally as well suited as ours to the cultivation of the sugar-beet.

The progress of Italy, as I before stated, is slow in every advancement. Their country is old and their people still wedded to old customs, and badly governed by a combination of temporal and spiritual rulers; their people harrassed and oppressed and discouraged, need only a new and more thorough regeneration. Though the daily wages of labor, are far less in Italy than they are in our own country, still it must be admitted that the spirit by which alone, man is inspired to the most heroic labors, is wanting there. Thus in Piedmont, according to Dr. Lardner, and where the original throwing machines for silk were first invented in former centuries, they are still content if the spindles to their machines do but revolve from 300 to 400 times in a minute. It was the same of late in France. But now those of the British in their throwing machines revolve 1800 times a minute; and will revolve and work well at 3000 in the same space of time. And lately, Ritson has made them revolve 4000 times. Now, let us look at the still greater improvements of America. Our spindles for spinning cotton, which work on the same principle as the spindles of the throwing machines of Piedmont, are made to revolve, working well, at the rate of about 5000 times in a minute. And the following important evidence has been kindly furnished me by Dr. Hobbs, the agent of the Waltham manufacturing Company. Twenty years ago, the Waltham factory put out all their cotton yarn to weave in private families; and the price they then paid for weaving No. 14 cotton yarn into cloth, 37½ inches wide, was from 8 to 12 cents a yard, which is fully equal to the average price which the same goods have sold for the last five years. Now by improvements in the *power looms*, the cloth of the same kind and quality is wove for 3-8 of a cent a yard; and a girl will tend two looms and occasionally three, and each loom will weave of this same quality of cloth, from 40 to 45 yards in a day of 12 hours. The improvements in spinning at these factories are even as great at this day, and far before all other times and countries. A girl now tends 256 spindles, which will spin 1,300,000 yards of No. 14 yarn in a day of 12 hours, (equal to about 733 miles) which is equal to 1548 hanks, or 110 lbs. To do this 20 years ago in a day of 12 hours on hand machines, would have required 500 girls. Now not only in manufactures of cotton, but in many other articles of manufacture we are able, quality considered, to undersell not only Britain, but any other nations, even in their own markets.

It has been remarked by the Baron Charles Dupin, who is deemed high authority for his sagacity and distinguished researches into all subjects connected with questions of commercial and political interest, that in all the most important branches of manufacture, a superiority the most decided, has been attained by those people with whom labor bears a higher price than with their rivals. He instances in proof, the cotton manufactures of England, which are afforded both cheaper, and of better quality than by any other people of Europe, although the price of labor is dearer in Great Britain than in any other country of the eastern world. Also, he instances the manufacture of linens in which the Dutch and the Belgians surpass and undersell the Bretons, although the price of labor is higher in Holland and in Belgium than in Britany. Furthermore, he has also shewn, that in the production of fine woollens, France surpasses and undersells Spain, although the price of labor is higher in France than in the latter kingdom.

The striking superiority in these instances, is ascribed by him to higher attainments in mechanical ingenuity and skill, and a more eminent degree of commercial knowledge and enterprise.

On a careful investigation, it will usually be found that the apparent difference in the price of labor between different countries, is rather nominal than real; and that in those countries where labor is higher in regard to price, there the greatest encouragement is always offered for the exercise of the ingenuity of man, in curtailing and diminishing its amount in every possible mode.—Sufficient and ample evidence of this important fact is taking place daily, and before our own eyes, and in our own country.

Respectfully your friend and humble servant,

WILLIAM KENRICK.

*Nonantum Hill, March 17, 1837.*

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### *Rules for Reading Books.*

[FROM HAWES' LECTURES.]

There are many who read a great deal, and yet derive very little advantage from what they read. Take an injudicious choice of books; they read without method and without object, and often without reflection. They are delighted with the notions which they read or hear, as they would be with stories that are told; but they do not weigh them in their minds as in a just balance, in order to determine their truth or falsehood; they make no observations upon them or inferences from them. Perhaps their eyes slide over the pages, or the words slide over their ears and vanish like a rhapsody of evening tales, or the shadows of a cloud flying over a green field in a summer's day. Or if they review them sufficiently to fix them in their remembrance, it is merely with a design to tell the tale over again and show what men of learning they are. Thus they dream out their days in a course of reading without real advantage. As a man may be eating all day—for want of digestion receive no nourishment—so these endless readers may cram themselves with intellectual food, and without real improvement of their minds, for want of digesting it by reflection. It is of great importance then, not only that we take heed *what* we read, but *how* we read.

In the first place then, read with *discrimination*. The world is full of books—no small portion of which are either worthless or decidedly

hurtful in their tendency. And as no man has time to read every thing, he ought to make a selection of the ablest and best writers on the subjects which he wishes to investigate, and dismiss wholly from his attention the entire crowd of unworthy and useless ones. There is another reason for this. Bad books contain a secret and deadly poison, and if they are read indiscriminately or without due caution, they are sure to corrupt the principles and destroy the soul. The young have great need to be guarded on this point. Many a youth has been destroyed by reading a single volume. You ought my friends to be as careful what books you read as what company you keep. Both exert a decided influence over your habits and character; and in making choice of either, you will, if you are wise, endeavor to obtain the following good advice.

*Read with attention.* Never take up a book merely for amusement, or for the sake of whiling away time. Time thus spent is worse than lost. It tends to form a habit of desultory, indolent thought, and to incapacitate the mind for confining its attention to close and accurate investigation.

Always read with your attention fixed—with your thoughts concentrated, and your mind intently engaged on the subject you are pursuing. This will enable you to follow the argument and illustrations of your author—to comprehend his aim and object—"to distinguish truth from error, good sentiments from bad, and sound reasonings from mere conjectures and bold assertions." While this mode of reading will enlarge your views and increase your stock of knowledge, it will also invigorate and strengthen your mind, and prepare you for higher and still more successful mental efforts.

*Read with reflection.*—It is a good practice, when you take up a volume to read, first to cast your eye over the introduction, table of contents, and heads of argument—and thus having obtained a general view of your author's object, close the book, for a time at least, and inquire with yourself what you know on the subjects discussed, and how you would treat them were you to attempt such an exercise. This will have a happy effect in forming your mind for original, independent thought, and at the same time it will prepare you to read the volume with greater interest, discrimination and profit.

One book read thoroughly, and with careful reflection, will do more to improve the mind and enrich the understanding than skimming over the surface of a whole library.

Indeed the more one reads in this hasty, superficial manner, the worse. It is like loading the stomach with a great quantity of food, which lies there undigested. It enfeebles the intellect, and sheds darkness and confusion over all the operations of the mind.

*Read with confidence.* It is often said man does not know his weakness. It is quite as true, he does not know his strength. Multitudes fail to accomplish what they might, because they have not due confidence in their powers, and do not know what they are capable of accomplishing. Hence they yield their understandings to the dictation of others, and never think or act for themselves. The only use they make of reading is to repeat the sentiments of their author. This is an error. When you sit down to the reading of a book, believe that you are able to understand the subject on which it treats, and resolve that you will understand it. If it calls you to a severe effort, so much the better. The mind, like the body is strengthened by exercise; and the severer the exercise, the greater the increase of strength. One hour

of thorough, close application to study, does more to invigorate and improve the mind, than a week spent in the ordinary exercise of its powers. Call no man master. Yield not your minds to the passive impressions which others may please to make upon them. Hear what they have to say—examine it, weigh it, and then judge for yourselves. This will enable you to make a right use of books—to use them as *helpers*, not as guides to your understanding—as *counsellors*, not as dictators of what you are to think and believe.

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*Hints on early Education.*

[FROM ABBOT'S MAGAZINE.]

1. Judicious mothers will always keep in mind that they are the first book read, and the last laid aside in every child's library. Every look, word, tone and gesture, nay, even dress, makes an impression.
2. Remember that children are men in miniature—and though they are childish and should be allowed to act as children, still all our dealings with them should be manly though not morose.
3. Be always kind and cheerful in their presence—playful, but never light, communicative, but never extravagant in statements nor vulgar in language nor gesture.
4. Before a year old entire submission should be secured; this may be often won by kindness, but must sometimes be exacted by the rod, though one chastisement I consider enough to secure the object. If not, the parent must tax himself for the failure, and not the perverseness of the child. After one conquest, watchfulness, kindness and perseverance will secure obedience.
5. Never trifle with a child nor speak beseechingly to it when it is doing any improper thing, or when watching an opportunity to do so.
6. Always follow commands with a close and careful watch, until you see that the child does the thing commanded—allowing of no evasion nor modification, unless the child ask for it, and it is expressly granted.
7. Never brake a promise made to a child, or if you do, give your reasons, and if in fault, own it, and ask pardon if necessary.
8. Never trifle with a child's feelings when under discipline.
9. Children ought never to be governed by the fear of the rod, or of private chastisements, or of dark rooms.
10. Correcting a child on suspicion, or without understanding the whole matter, is the way to make him hide his faults by equivocation or a lie, to justify himself—or to disregard you altogether, because he sees that you do not understand the case, and are in the wrong.
11. When a child wants that which it should not have, or is unwilling to do as the parent says, and begins to fret, a decided word spoken in kindness, but with authority, hushes and quiets the child at once; but a half yielding and half unyielding method only frets and teases the child, and if denied or made to obey, ends in a cry.
12. It is seldom well to let the child "cry it out," as the saying is. If put in a corner or tied to your chair, it should not be to cry or make a noise. Indeed, crying from anger or disappointment should never be allowed. A child soon discovers that its noise is not pleasant, and learns to take revenge in this way. If allowed to "vent their feelings" when children, they will take the liberty to do so when men and women.



13. Never allow a child to cry or scream on every slight occasion, even if hurt, and much less when by so doing it gratifies a revengeful or angry spirit. This should be specially guarded against in infants of ten, twelve, or eighteen months old, who often feel grieved or provoked when a thing is denied or taken from them.

14. Never reprove a child severely in company, nor make light of their feelings, nor hold them up to ridicule.

15. Never try to conceal any thing which the child knows you have, but by your conduct teach him to be frank and manly and open—never hiding things in his hands nor slyly concealing himself or his designs.

16. Kindness and tenderness of feeling towards insects, birds, and the young, even of such animals as should be killed if old (excepting poisonous ones) are to be carefully cherished.

17. I am pleased with such children as allow those roses and flowers that blossom on the Sabbath to remain on the tree to praise their Maker in their own beauty and sweetness.—“This is the incense of the heart, whose fragrance smells to heaven.”

### *On the Impregnation of Plants.*

[FROM THE GENESEE FARMER.]

The January number of Professor Silliman's *Journal*—a work which deserves the support of all interested in the higher departments of the Natural Sciences—in addition to a great variety of other valuable papers, contains one by Dr. Gray of New York, being in part a translation of the celebrated Corda's researches on the impregnation of plants. As the subject is one of interest, we have thought that a condensation of the paper, adapted to the general reader, might prove acceptable to at least some of our readers.

“*Omne ex ovo*, or every thing from an egg,” was the exclamation of an old philosopher, in regard to the animal creation, and later investigations show that it is scarcely less applicable to the vegetable one. The fertilizing properties of the farina or pollen of plants has long been known, but the manner in which this effect was performed, as was to be expected where the operation was conducted in the silence and mystery of nature, led to a great variety of speculations. Every farmer knew that the yellow dust which fell in such quantities from the corn blossoms upon the silken tassels of the ear was necessary to the formation of the kernel, but few were able to explain the cause of this necessity or the mode in which the plant was rendered fruitful. Every house-wife has, during the summer months, seen her reservoirs, or cisterns of rain water covered with a yellow powder, which by most is considered sulphur, as it appears most plentifully during thunder gusts accompanied by high winds. The peculiar odor which belongs to this substance when burning, may have assisted in originating the error with regard to the origin of this dust, which is the pollen of the forest trees, as any one may be convinced by walking in the woods when this fecundating dust is falling. This dust may be easily seen and collected for observation on the blossoms of the different varieties of the melon, pumpkin, and cucumber.

Pollen, when examined by a moderate magnifying power, is seen to consist of a multitude of grains of some regular form, which is uniform in the same species, but often widely different in different kinds of plants. These grains are composed of two coats, of which the ex-

terior is thick and nearly inelastic, while the inner is exceedingly delicate and highly extensible. The cavity is filled with a fluid which, under a powerful lens, appears slightly turbid, on account of a vast number of minute granules which float in it. A magnifying power of three hundred reveals the existence of two kinds of granules in the fluid of the pollen grains. The first is large and few in number, and are from the 4000th to the 5000th of an inch in diameter. The smaller particles, or *molecules*, as they are termed by Brown, who here seems to have led the way in discovery, are from the 15,000th to the 30,000th of an inch in diameter. The microscope shows a motion of these particles in the fluid, movements not confined to a mere change of place, but a change of form in the particle itself; and Brown asserts that he was "convinced from repeated observations that they are produced neither by evaporation or currents in the fluid, but that they pertain to the particles themselves."

But whatever may be the nature of this fluid or the granules it contains, it is evident that to the pollen the power of impregnation belongs, and three hypotheses have been advanced to account for its agency in the production of the vegetable embryo. According to one view, a germ furnished by the pollen is supposed to be deposited in and nourished by the *ovule*; according to another the germ is thought to be originally formed in the *ovule* itself, and is merely excited to action by an influence derived from the pollen; while according to the third the embryo is conceived to result from the union of a germ furnished by the pollen with another produced by the *ovule*. Recent discoveries have rendered it probable that the first supposition, though attended with some difficulty will be found nearest the truth.

It was discovered by Needham that grains of pollen, moistened or thrown upon water, burst with violence, and discharge the slightly viscous and turbid fluid contained in them. This effect was also sometimes produced when the pollen fell on the moist surface of the stigma, and hence to this fluid the immediate agency in impregnation was attributed by Linnaeus and contemporary botanists, they in general supposing that the fluid was directly conveyed down the style to the *ovule* where the fecundating power was exerted. Whatever speculations might have been on the subject, the actual knowledge of naturalists was confined to the simple fact, that the application of the pollen to the stigma was essential to the fertilization of the *ovule*, all the information gained respecting the action of the pollen after it has reached the stigma being of recent date.

The very great improvements made in the microscope within the last twenty or thirty years had prepared the way for further advances in science, and the career of discovery in the impregnation of plants was opened in 1823 by Prof. Amici of Italy. In examining some grains of pollen on the stigma of the *Portulacca oleracea*, or common purslain, he observed that the grains had projected from some part of their surface an extremely slender tube, which was found to consist of the inner lining of the pollen-grain protruded through the external coat. Amici published the result of his discoveries, which immediately attracted the notice of Brougniart and Brown, the first of whom published a memoir in 1827, to which we are indebted for the earliest and most complete account of the manner in which these tubes originate and act upon the stigma. When grains of pollen fall on the stigma, they are retained either by the hairs with which this organ is often provided, or by its slightly humid and viscous surface. This moisture they

slowly absorb, and after an interval varying from an hour to a day or more, the outer coat opens by one or more coats or slits, through which the highly extensible inner membrane protudes like a hernial sac, and is slowly prolonged into a delicate tube. These tubes are so extremely attenuated that a powerful microscope is required for their examination.

The grains of pollen produced by some plants, (particularly in the Cucurbitaceae,) are known to protrude several tubes from different points, and Amici detected as many as twenty or thirty from a single grain. One of the most singular facts shown by the investigations of Brown was, that the stigma of one plant would excite the same action in the pollen of different species, and even of plants belonging to different families. Thus Dr. Brown applied the pollen of species of *Asclepias* to the stigma of an Orchideous plant, and found these tubes produced as readily as when placed in contact with the stigma of the plant from which the pollen was taken. Here was a clue to the manner in which hybrids were formed; and a plausible reason shown why the seeds of such plants when grown, did not resemble the fruit from which they were taken, but showed a disposition to revert more or less to their original type, according to a fundamental law of nature.

The tubes thus produced from the pollen when placed in contact with the stigma, penetrated its substance, not however by means of any particular channel, but by insinuating themselves between the cellules, and along the intercellular passages which abound in the tissue of the stigma and style. M. Brougniart was able to follow them for only a moderate distance into the tissue of the style, where he imagined the tubes terminated, and opening at the extremity, discharged the fluid and floating particles of the pollen grain. Dr. Brown was more successful in tracing their course. He followed the course of the pollen tubes in several plants of *Orchidea* and *Asclepiadea* from the stigma to the placenta, and in a single instance, in an Orchideous plant, traced some vessels or tubes of an equivocal nature quite into the aperture of the ovule. Dr. Brown published an account of these discoveries in 1831, and remarks that Mr. Elliot in his *Botany of South-Carolina and Georgia*, had observed these *cords* or *fibers* in the *Asclepias*, but it is probable their origin or office was not suspected.

Such was the state of knowledge respecting the impregnation of plants, when M. Corda, a member of the Imperial Academy, commenced his observations. Dr. Brown had traced the pollen tubes to the mouth of the ovules, and M. Corda devoted himself to determine the interesting inquiry as to their farther progress and termination. As subjects of examination he selected the Coniferae or Fir tribe, in which the ovules are naked, and impregnated by immediate contact with the pollen, consequently offering great facilities for the investigation. Aided by powerful instruments, and conducting the processes with great skill and perseverance, M. Corda was able at last to trace the pollen tubes into the ovule itself, where the fluid of the pollen gave the first impulse to the formation and development of the embryo. The following is the summary of the discoveries made by M. Corda, translated from his memoir by Dr. Gray, and which in the Coniferae establish these positions:—

“1. The pollen tube penetrates into the micropyle, (exostome, and in *Pinus* the pollen grains fall directly into it; whence the impregnation is immediate.

2. The pollen tube passes through the exostome into the endostome, passes through the cavity of the secundine, and arrives at

3. The nucule or ovule; extends through the endostome into its cavity, and

4. By the injection of the fluid contained in the pollen grains into the bottom of the nucule gives the first *heim* (germ) to the formation of the embryo.

5. The formation and developement of the embryo changes the contents of the cellular tissue of the nucule, which becomes fluid, and appears to furnish materials for the growth of the embryo.

6. The pollen tubes remain fixed (to the embryo sac) sometimes after impregnation and the commencement of the developement of the embryo in the latter."

The translation of the memoir in the Journal, is accompanied by a series of engravings representing the process of impregnation, from the formation of the pollen tubes, to their entrance into the ovule and the discharge of their contents, embracing the first rudiments of the embryo.

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### *Milking Cows.*

[FROM THE NEW ENGLAND FARMER.]

A writer in the Scotch Farmer's Magazine, gives the following *Directions to the Dairy Maid*. "Go to the cow stall at 7 o'clock; take with you cold water and a sponge, and wash each cow's udder clean before milking; douse the udder well with cold water, winter and summer, as it braces and repels heats. Keep your hands and arms clean. Milk each cow as dry as you can, morning and evening, and when you have milked each cow as you suppose, dry, begin again with the cow you first milked, and drip them each; for the principal reason of cows failing in their milk is from negligence in not milking each cow dry, particularly at the time the calf is taken from the cow. Suffer no one to milk a cow but yourself, and have no gossiping in the stall. Every Saturday night give an exact account of the quantity of milk each cow has given in the week."

Might not warm water, particularly in winter, be best? Perhaps brushing the bag with a soft brush would answer a good purpose.

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## MISCELLANEOUS INTELLIGENCE.

### PART III.

**Culture of Root Crops.**—There is nothing that will ever contribute to the prosperity and advancement of the agricultural interest of Susquehanna County in so great a degree as the culture of Root Crops. There is no country on the face of the Globe better adapted to their production than this country. Potatoes, Turnips, Ruta Baga and Beets, seem destined by nature to fill the country, and a comparison of such crops with the best wheat crops will show at a glance, the infinite and immeasurable advantages which the former furnishes.

A fair crop of wheat in the best wheat soils is 40 bushels. We will take it at the present price, \$1.75 per bushel, \$70.00

The most ordinary crop of potatoes is 200 bushels to the acre; we have never raised less than 300 bushels except in one instance when it was a total failure. The ordinary price of potatoes is 25 cts. when wheat is at \$1; making the price when wheat is at \$1.75—44 3-4 cts. at 200 bushels the crop would be, 87.50

When the crop is 300 bushels, which is no higher estimate than 40 bushels of wheat, it would be, 131.25

But taking instead of the potatoes, a crop of turnips; we have the usual estimate of 800 bushels at 20 cents per bushel, and they amount to 160.00

Two bushels are always estimated by cattle feeders equal to 1 bushel of corn. They may therefore be safely calculated as worth 35 cts. making, 280.00

Difference in favor of potatoes, - - - - - \$51.25

Do. in favor of turnips, - - - - - 280.00

Facts like these need no comments; they fully justify the remark of Lord Kames, a celebrated English agriculturalist, that if any man was entitled to the epithet of Benefactor of his country, it was the humble individual who first introduced the culture of turnips. There is no crop equal to them for ameliorating the soil and preparing it for grain. There is none that exhausts it less, and there can be nothing more useful as sheep or cattle food. And to these truths, that many instances can be furnished where the crop of potatoes has reached 600 and the crop of turnips 1200 bushels, and we see at once the magnitude of the loss that our best Farmers are constantly sustaining by their efforts to raise the small grains. Will they never learn wisdom from EXPERIENCE.—*Susquehanna Register.*

**Turnips, Corn, Potatoes, &c.**—Assuming that 600 bushels of Swedish turnips will grow upon an acre of ground which will produce thirty-five bushels of corn, and that six bushels of the Swedes will fatten as much as one bushel of corn, it will be seen that one acre in ruta бага will go about as far in making beef as three acres in corn, with the further advantage that the latter will cost four times as much labor in its culture as the former. We have given an instance of the Swedes yielding more than 1500 bushels to the acre, and the opinion of an intelligent feeder that two bushels are as much for feeding, as one bushel of corn. The mangel wurtzel, the carrot and the parsnip, may be all raised in field culture, at about the same expense as corn, and they will give as great a yield, and afford as much nutriment as the ruta бага. The potato, whose culture we are all acquainted with, should be made to yield 300 bushels per acre; and these afford a far more more profitable food than grain. A bullock will consume from 120 to 240 pounds of ruta бага per day; but if full fed with this or other roots, they will consume but little hay, and have little or no occasion for water.—*Cultivator.*

**Heat of the Earth's centre.**—Experiments tried in a well or drill hole, 800 feet deep, at Montpelier, Vt., have shown that the increase of heat in descending, is at the rate of one degree for every 80 feet. Such an increase would indicate that in, descending towards the earth's centre, at no very great distance from its surface the heat must be such as to hold in a state of fusion, any body with which we are

acquainted, and would seem to prove that the globe is in fact in the depths of its interior, a large mass of materials, heated to melting. How far the above experiment may go to account for the existence of the hot springs which are found in various countries, we leave it to the scientific to decide; one thing is certain, that whatever may be the state of things at the centre of our ball, people on its outside, are too often apt to get into hot water.—*New England Farmer*.

**Importation of Wheat.**—Within a few days grain has arrived at this port from foreign ports, as follows—Bremen, 1938 bags wheat; Marseilles, 8000 bushels of wheat; Trieste, 3,658 bags rye; Dantzic, 60 casks wheat.—*N. Y. News, Feb. 15th*.

**Murder.**—Murder of what? Why of a beefsteak! See that cook—she puts a good beef steak over a slow fire, instead of a hot one. Instead of doing it quick, she broils it slowly for an hour; then it is as tough as leather. Then she greases it till it swims in rancid butter. When it is cold, or nearly so, she brings it on the table. Is not this murder?

**Silk Manufacture in England.**—Some estimate of the extent of the silk manufacture in England may be made from the fact that 30,682 laborers were employed in the business last year. Of this number 10,188 were males, and 20,494 were females. Of both sexes were 9,074 between the ages of 8 and 13.

**Silk in France.**—In France although they raise so much silk, they still import annually, to the amount of 43,000,000 francs of raw silk, or nearly one third of all they consume, for the supply of their manufactures.

**Corn and Oil.**—It is said that the oil of Indian corn is used in Cincinnati as a substitute for sperm or whale oil. It is said to produce an equal quantity of light, to be quite as transparent and free from disagreeable odor, in addition to which it is not subject to freezing, having resisted the greatest degree of cold during the present season—say 6° below zero. The yield of oil is said to be half a gallon to the bushel, without destroying the qualities of the grain for distillation.—*Boston Transcript*.

**Choice of Geese.**—In choosing your Geese for the table, care should be taken that the feet and legs be yellow, which is an indication of the bird being young; the legs of old geese are red. If recently killed, the legs will be pliable, but if stale they will generally be found dry and stiff.—*Yankee Far*.

**Population of Texas.**—The population of Texas, as given by H. M. Morfit, in his correspondence with the Secretary of State, is 50,000, of which 30,000 are Anglo-Americans from the United States: 3,500 native Mexicans, of Spanish descent; 12,000 Indians, and 5,000 Negroes.—The additional territory claimed since the declaration of independence will increase the population to 65,000. Exclusive of the army of 2,200, there are 5,000 able-bodied farmers, which, in an emergency, would furnish 3,000 of their number.

**Green Tea.**—The London Quarterly Review states that the very prevalent preference for green tea (so called) in the United States, has given rise to an extensive fraud upon the community of this country by the Canton merchants, in the supply of our markets by the worst kind *coarse Bohea* converted into 'green' by a composition of turmeric, indigo, *white lead*. The writer says he saw 50,000 chests of this spurious article ready for shipment, which he was told was for the American market; and that *two thirds* of the tea annually used in America, was of the same quality.

**Garden of Plants at Paris.**—The Garden of Plants at Paris has been gradually increased for the last 40 years, till it now extends over a surface of 84 acres. It contained about 526,000 specimens of the vegetable, animal, and mineral world, on the 1st of January last. There are in the gardens, hot houses and conservatories, upwards of 10,000 different specimens of trees and plants.

**Animal Instinct.**—Cows are fond of dandelions, and are kept in health by frequent shampooing. Rats will go anywhere where the oil of rhodium is dropped. Rooks leave tree the moment they are marked for felling, and a dog that has never been in London before, will find his way to his master's residence in any part of the metropolis, in three hours, after having been thrown into the Thames from the centre of any one of the bridges.—*John Bull*.

## ADVERTISEMENT.

### GREY SULPHUR SPRINGS.

Extracts from a Pamphlet, entitled, "An Account of the Medical Properties of the Grey Sulphur Springs."

THE GREY SULPHUR SPRINGS are situated near the line dividing the counties of Giles and Monroe, Virginia; on the main road leading from the court-house of the one to that of the other. They are three-fourths of a mile from Peterstown, 9 miles from the Red Sulphur, and by the county road, 20 miles from the Salt Sulphur Spring. In travelling to the Virginia Springs, by either, the main Tennessee or the Good-spur-gap roads, and crossing the country from Newbern, by the stage-road to the sulphur springs, the Grey Sulphur are the first arrived at. They are 30 miles distant from Newbern.

There are two springs at this establishment, situated within five feet of each other, and inclosed in one building. Although rising so near to each other, yet they differ most materially in their action on the system. Both appear peculiarly serviceable in dyspeptic cases, and in such as originate in a disordered state of the stomach. The one, in those in which inflammation exists; the other, in such as proceed from torpidity. They are known as the Old, or Anti-Dyspeptic; and the New, or Aperient, springs.

The examinations hitherto made, relative to the constitution of these waters, warrant the belief that the following ingredients are present :

Bi-carbonate of Soda,†  
Super-carbonate of Lime,  
Bi-carbonate of Magnesia,  
Super-carbonate, or crenate of protoxide of Iron, or both,  
Sulphate of Magnesia, } in traces.  
Sulphate of Soda, }  
Chloride of Calcium, } in traces.  
Chloride of Sodium, }  
Silicic Acid,  
Hydro-Sulphuric Acid,  
Nitrogen,  
Alcaline, or earthy crenate?\*

All of the examinations hitherto made, have resulted in showing a perfect similarity in the composition of these two springs; or rather, no ingredient has as yet been detected in the one, which has not been found also in the other. We are, therefore, led to the conclusion, that their difference of action is occasioned by a difference in the relative proportions of their several ingredients. The Aperient Spring appears to give rise to a greater amount of hydro-sulphuric acid, as well as of iron, but not in such quantities as satisfactorily to account for the opposite effects produced by these two springs.

The action of the Anti-Dyspeptic Spring is diuretic, and gently aperient, tending to restore the healthy performance of the functions, and reduce or diffuse the local irritations of disease. This appears to be brought about by *equalising the circulation*—a property, the great importance of which will be at once recognised by medical men. \* \* \*

\* To be had gratuitously of Mr. A. E. Miller, No. 4, Broad-street. Applications to be post paid.

† It cannot be determined whether free carbonic acid exists in these waters, without going into a quantitative analysis. C. U. S.

## ADVERTISEMENT.

For the more particular information of the reader, we submit the following synopsis of the medical properties of the Anti-Dyspeptic spring :

### MEDICAL PROPERTIES, Of the Anti-Dyspeptic Spring.

1. It relieves nausea and headaches arising from disordered stomachs.
2. Neutralizes acidity, and if taken at meals, or immediately after, it has a tendency to prevent those unpleasant sensations so often experienced by invalids, from indiscretion in dieting.
3. Is an excellent tonic, exciting appetite, and imparting strength to digestion.
4. Quiets irritation of the alimentary canal.
5. Controls and lessens the force of the circulation, when unnaturally excited by disease, and often in this way is remedial in internal inflammation of the organs.
6. It tranquillizes nervous irritability.
7. Is a mild and certain expectorant, often allaying dyspnoea, and promoting recovery from chronic ailments of the chest or wind-pipe.
8. It alters the action of the liver, where this has been previously deranged, in a manner peculiar to itself, and under circumstances in which the ordinary alteratives are forbidden, by reason of their exciting, or other irrelevant properties.
9. It is also sudorific, or diaphoretic, and
10. When taken at bed-time, often proves itself soporific : apparently stilling that indescribable, but too well understood inquietude, which so frequently and unhappily interrupts, or prevents the repose of the invalid, and especially of the dyspeptic.
11. It possesses, farther, the highly valuable property of correcting those depraved conditions of the female constitution, from which arise many of the peculiar disorders to which they are liable. As decidedly tonic, it removes such as depend upon relaxation and debility (such as Fluor Albus and Menorrhagia,) and, by virtue of its deobstruent qualities, carries off obstructions, and promotes all the natural discharges and excretions.

### THE APERIENT SPRING.

In addition to the alkaline properties of the Anti-Dyspeptic, the Aperient Spring possesses high stimulating qualities, peculiarly serviceable in those cases in which stimulants are recommended ; such as torpidity of the digestive and nervous systems ; in headaches from costiveness, and in hæmorrhoids. It is a powerful tonic, and has an aperient and alterative action. \* \* \*

Extract of a Letter from Dr. JOHN DICKSON, of Charleston, So. Ca., who visited the Grey Sulphur the last season :

"After a short but agreeable sojourn at the Grey Sulphur Springs, I feel warranted to give a very favourable account of the place. The following brief statement will exhibit the impressions made on my mind by the visit.

1. Without any invidious comparisons, I consider the locality as peculiarly happy. It is dry, airy, and interesting, affording pleasant walks and rides, and furnishing, in mineralogy, geology, &c., a new and instructive field of observation. The quiet and convenience of the establishment itself, with its freedom from dissipation and crowding, must strongly recommend it to a large class of invalids.

2. The results produced by the use of the waters, are so remarkable as to afford much encouragement to the patients suffering from the various, and sometimes unmanageable disorders of the digestive organs. In many anomalous cases of stubborn chronic disease and complicated infirmities, I should feel a strong desire to make trial of these waters."